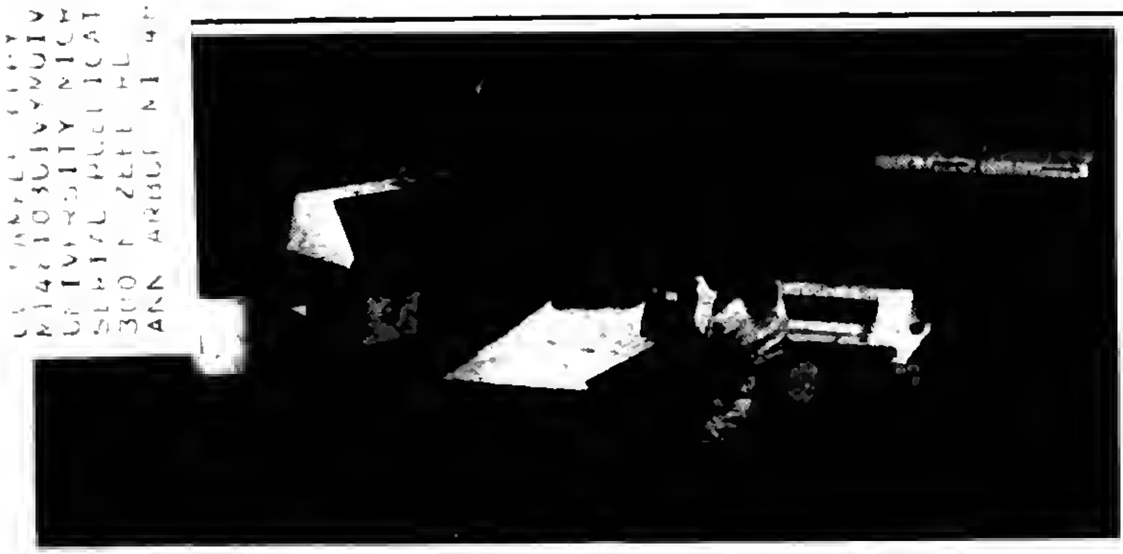
COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.

May 3, 1976 Vol. X, No. 18



The Burroughs B80 features a double-sided floppy disk drive which may prove two heads are better than one.

The Criterion series with single bus design, introduced by NCR, signals an architectural departure for the firm. Pictured above is the 8550 with operator console, card reader, disk units and line printer.

Burroughs Introduces B80 With Double-Sided Floppy

By Esther Surden

Of the CW Staff

DETROIT – The B80 from Burroughs Corp. is a small general-purpose system primarily designed for business applications and featuring a double-sided floppy disk as storage media.

The B80 is the first in a series of modular systems slated to be introduced in the near future, Burroughs said.

The "super minidisk" is a flexible media capable of storing 1M bytes of data with an average random-access time of 266 msec, Burroughs said.

The floppy's increased byte capacity was attributed to a combination of higher density recording and recording on both sides of the disk.

Two floppies are housed vertically in the B80 cabinet; each drive has two heads to access both floppy sides, a spokesman said.

The B80 system, which Burroughs said is cost-effective for large organizations with branches that wish to place computing power where management information is required, can also be used by first-time users who wish to upgrade from a less advanced system.

Burroughs B700 RPG and Cobol programs are source code-compatible with the B80 and may be recompiled and used on the system, the firm said.

Computer Management System (CMS) software, introduced for the B80, is an integrated system of operating and application software, Burroughs said, designed for modularity.

Elements of CMS

Included in CMS is the Master Control Program (MCP); RPG and Cobol compilers for applications programs; data communications, interpreters and utility programs; the Burroughs Data Base Bridging System and the Burroughs Business Management System (BMS) application program products, the firm said.

The MCP allows additional peripherals, applications, I/O devices and communications units to be added to the system without any reprogramming, Burroughs said.

The microprogrammed central processor for the B80 consists of small read-only "nano" memory, a micro stack, I/O logic and system registers contained on nine LSI circuits on a single printed circuit board, Burroughs said. The processor operates at 1 million cycle/sec, it added.

The B80's MOS main memory has a 1 µsec access time and is expandable from 32K bytes to 61K bytes in 4K-byte increments, the firm said. The remaining 3K of memory is reserved for cold starts and maintenance testing, the spokesman said.

The system is capable of communicating either asynchronously or synchronously at speeds from 75 bit/sec to 9,600 bit/sec over leased, switched or direct connect lines, Burroughs said. Burroughs Data Link Control (BDLC) procedure and the Network Definition Language (NDL) compiler for implementing or reconfiguring a network can be used.

The Message Processing Language compiler provides a method to interface between NDL and the user program, Burroughs said.

(Continued on Page 8)

Series of Modular Systems

NCR Criterion Features Single Bus Design

By Esther Surden

Of the CW Staff

DAYTON, Ohio – The NCR Corp. Criterion series of medium- and large-scale systems introduced here last week features single bus architecture and modular design.

The systems, which represent an architectural departure for NCR, are said to be object code-compatible with the more powerful members of the firm's Century series they are meant to replace.

Century users can bring their peripherals with them to the Criterion series, a spokesman added.

Designed for telecommunications, data base and distributed processing applications, the Criterion 8550 and 8570 provide about 35% more processing power at less cost than comparable IBM 370/115 and 370/135 systems, the spokesman said.

An 8550 processor with 128K of memory costs $107,400, NCR said. A comparable 370/115 costs $176,050, according to an IBM spokesman.

The 8570 processor with 256K bytes of memory costs $282,700, according to NCR, while a comparable 370/135 costs $466,500, IBM said. The prices cover the cost of the CPU only.

Model Differences

The primary difference between the two Criterion models are processor cycle time and the maximum amount of main memory that can be accommodated.

The 8550 has a 112 nsec cycle time and can handle up to 512K bytes of error-correcting MOS main memory in 64K-byte increments; the 8570 is faster, with a 56 nsec cycle time, and has a 1M maximum error-corrective MOS memory in 128K-byte increments, the firm said.

Transfer Bus at Center

The systems were designed around an internal transfer bus. Circuit boards – which contain the CPU, up to two minicomputer disk controllers, a maximum of four microprocessor-based communications controllers, I/O trunks and a dedicated service processor for diagnostic control – plug into the bus, the spokesman said.

The power supply and cooling unit are also contained in the Criterion "box."

An important Criterion feature is the system's flexibility, NCR said. Firmware resident in 256 bytes of flexible disk can be loaded into the internal storage unit to enable the Criterion to present itself to users as though it were a Cobol virtual machine, multiprogramming system or NCR Century system, the firm said.

Other Criterion system features include·

(Continued on Page 8)

Handles 12 Concurrent Tasks

'DOS/MVT' Dynamically Uses Memory Regions

By Don Leavitt

Of the CW Staff

MILL VALLEY, Calif. – The DOS/MVT operating system from Software Pursuits, Inc. (SPI) allows IBM 360/370 installations now under DOS to break away from fixed memory partitions and replace them with dynamically allocated regions similar to those long available under OS, the vendor said.

As many as 12 batch regions can be controlled concurrently under this system, a spokesman claimed.

Described as a "total rewrite" of IBM's software, DOS/MVT is nonetheless "fully compatible" with DOS Release 26 – the last IBM release for the 360 – and user programs can run under the SPI system "without modification," he continued.

The package "supplies nearly all system features of all other vendors [of DOS enhancements] combined," the company stated.

The software is limited, however, only to the larger installations since user sites must have at least 192K bytes of main memory.

DOS/MVT facilities "always" provide "at least a 20% improvement" in throughput over competitive systems and "frequently permit a 100% improvement," the vendor claimed.

Regions Stay Same

All regions are functionally the same to the DOS/MVT user. Each region is capable of executing any program, and all system and private libraries can be shared by all regions and by multiple CPUs, according to SPI.

DOS/MVT is capable of loading and executing programs link-edited with common self-relocation systems or with a system built into the SPI software. "Blocked Fetch" loading is available, but memory-resident directories and programs can also be used, the spokesman added.

Reentrant programs – a single copy of the code executed by several users simultaneously – is supported under DOS/MVT, he said. So are concatenated or linked Core-image libraries, providing more effective facilities for locating a program, he explained.

A multipath channel scheduler allows I/O devices to be connected to "any number" of selector channels, permitting many configurations "never before possible," and generally improving channel and device utilization, he said.

Main tasks and subtasks are each cap-

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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone (01) 485-2248/9; Telex: 264737. **W. Germany:** Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. **Asia:** Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.
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50 cents a copy, $15 a year in the U.S., $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.
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Mass. Welfare Department Hires DPers To Pinpoint Cheaters by Matching Lists

By Nancy French
Of the CW Staff

BOSTON – The Massachusetts Department of Public Welfare has hired a specialized DP service group here to help match 6 million personal records this year in an effort to spot welfare cheaters.

The program is expected to reduce overpayments and eliminate payments to ineligible recipients – errors that now cost the state an estimated $7 million to $10 million a year, according to Commissioner Alexander Sharp who heads the welfare department.

Besides assuring no recipients are illegally receiving more than one type of public assistance, the program is expected to provide fraud safeguards and ultimately increase child support revenues, according to Sharp.

Urban Data Processing, Inc. (UDP) of Burlington, Mass., won the competition for a one-year $184,000 contract that involves combining lists of recipients of Aid to Families with Dependent Children, General Relief, Food Stamp and Medicaid with information contained in the files of other state agencies.

But combining a couple of mailing lists with different structures and formats for name and address files is no easy task.

UDP will do the job by first "normalizing or standardizing the formats as well as the components within each field on every agency's list of recipients, Max Eveleth Jr., UDP president, explained.

Using proprietary software systems known as the Street Address Matching System (Sams) and the Customer Information System (CIS), UDP will disaggregate each original record furnished by the state. UDP's software is based on pattern recognition and table lookup techniques, he said.

Record Creation

New records, organized by name, street address, city, state, Zip Code and file source code will be created. The records will also contain other variable data that in some cases includes Social Security number; however, the Social Security number will not be used as a key in matching he emphasized.

UDP's programs were originally developed for use by banks that wanted to get a thorough picture of their customer's accounts and dealings with the institution, to see what other services each customer could be encouraged to utilize, he explained.

The state will furnish the lists on magnetic tape; processing will be done at UDP; and the names, matched in accordance with welfare department's predetermined criteria, will be returned to state personnel, ready for printing, according to Harry Kreide, project manager in the welfare department's DP center.

Specialists will determine whether certain records are simply duplicates, whether the address data is incorrect or out of date, or whether in fact the recipient appears to be cheating, Kreide said.

If evidence of cheating is found, caseworkers will follow up with an investigation of the case involved.

Privacy Assurances

To assure the privacy of recipients, no printing will be done by the contractor, Kreide said.

In addition, UDP will be bound by all the privacy regulations and standards that govern the welfare department itself, and these will be specified in the contract, he added.

In addition to matching the files, UDP will help the Department of Public Welfare convert the software so that, by the end of the one-year contract, the programs can be run on the department's internal system.

The software was written for use on an IBM 370/158, running under OS/VS, whereas the state uses an IBM 370/145 running under DOS.

Fifty percent of the cost will be reimbursed by the Federal government, according to Sharp

The new matching system is expected to be a great improvement over methods used previously which were limited primarily to cross-checking Social Security numbers, Kreide indicated.

Mini Aids 'Home of Gods' Study

WALTHAM, Mass. "The place the gods call home," an ancient city northeast of Mexico City, is being studied for answers about its lifestyle and civilization with the help of a minicomputer.

Geroge Cowgill, professor at Brandeis University here, is in charge of the investigation to discover what kind of people lived in pre-Columbian city called Teolihuacan.

While identification of the more than one million artifacts found in the city has been done manually, a Digital Equipment Corp. Decsystem-10 is being used for discriminant and factor analysis as well as data storage and retrieval, Cowgill said.

The data is grouped in categories and then correlated. Correlations are made for each artifact in reference to the neighborhood in which it was found and the kinds of people who used it.

Computer graphics are used to make maps of the distribution of artifacts across the city in the research effort, which is supported by grants from the National Science Foundation.

The data is compiled from examining different areas of the city and the various classes existing in the society.

By discovering what types of people used what type of things, a pattern of the culture and lifestyle of the people is being pieced together, Cowgill said.

CW Sister Born in South America

RIO DE JANEIRO, Brazil – A biweekly newspaper, *DataNews*, has started publishing here.

The newspaper, a sister publication of *Computerworld*, is oriented to the DP user and features a range of product announcements and articles on various issues affecting the DP community.

The paper is written in Portuguese and includes one page in English of either an entire article or summaries of several items.

Donald M. Best is editor, headquartered at Av. Rio Branco 156/Sala 1222, Rio de Janeiro ZC-21.

DataNews is published by Computerworld do Brasil, Servico e Publicacoes, Ltda. and has staff both here and in Sao Paulo.

There are currently 7,000 subscribers. The annual rate for an airmail subscription outside of Brazil is $50. For delivery within Brazil, the annual rate is 250,000 cruzeiros.

Six-month subscriptions are available at $25 and 125,000 cruzeiros.

DataNews appears the first and third Mondays of each month. Other publications in the *Computerworld* family include *Shukan Computer* in Japan and *Computerwoche* in West Germany.

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Chairman Cites Recent Decisions

AT&T Charges FCC With Risking Phone Net's Integrity

By Ronald A. Frank
Of the CW Staff

PHILADELPHIA – Recent decisions by the Federal Communications Commission (FCC) have threatened the technical integrity of the telephone network and will ultimately lead to higher costs for home telephone users, according to John deButts, AT&T chairman.

Speaking at the AT&T annual meeting recently, deButts defended Bell's proposed congressional legislation as an attempt to apply "public interest standards to regulatory decisions as to where competition should apply and where it should not."

The bill, known as the Consumer Communications Reform Act of 1976, would amend the Communications Act of 1934 under which the FCC operates [CW, March 22].

"The telephone industry is not asking Congress to choose between monopoly and competition in the supply of communications services in this country," he said.

DeButts charged that recent FCC decisions jeopardize the quality of phone service "by encouraging wasteful duplication of facilities, add unnecessary costs to the nation's phone bill and, by forcing basic phone rates up, they restrict [service] availability."

The FCC, through recent decisions, has taken issue with the basic principle that the telephone network "is a major national resource that needs to be carefully guarded," he said.

The FCC decision establishing the specialized carriers allowed parallel facilities to be built alongside phone company equipment "without sharing [Bell's] obligation to serve all routes," deButts said.

The FCC also required AT&T to provide facilities to "these same competitors that enable them to provide their customers [with] direct access to the switched [phone] network," he added.

The FCC ruled in March "that the telephone companies, which have historically been held accountable for the quality of their service from end to end, must now permit direct connection to the network – that is, without any intervening protective device – of customer-provided telephones. . .and other terminal equipment which, having no responsibility for them, the telephone companies cannot assure will be properly installed or adequately maintained," he said.

"These developments seriously threaten the technical integrity of the network and compromise our ability to plan it as a whole," deButts told the stockholders.

Already Creating Problems

"Already [the FCC decisions] have begun to create difficult and expensive problems of accommodation as we are required to mate our facilities to those of competitors with different design standards, different operating methods, different maintenance procedures," deButts said.

"Already they have begun to complicate the task of network planning, requiring us to cope as best we can with the imbalances that arise when competitors use our facilities to optimize results for *their* customers without regard to the impact of their doing so on *all* customers," he said.

"And already we can see that the FCC's brand of competition, instead of spurring innovation, will impede it.

"It will impede it by dividing among two or more carriers traffic that could more economically be handled by one and that, if it were, might sooner warrant investment in the higher capacity transmission systems that would mean lower unit costs for everybody.

"And already we can see, as more and more hardware over which we have no responsibility is hung on the ends of our lines, the prospect of more and more hassles over whose fault it is when things go wrong, whose responsiblity it is to fix it and who will pay for the fixing."

The FCC actions have created not competition but regulated competition, "a bureaucratically administered allocation of the market. In the terminal area we are regulated, but our so-called competitors are not. . .[they] are free to write their own price tags," deButts said.

"This isn't true competition. It is rigged competition," deButts charged.

"I hope you will write your senators and congressmen. . .and tell them what you think," deButts told the meeting.

NRMA Meeting to Consider Impact of Privacy Laws

NEW YORK – The National Retail Merchants Association (NRMA) will consider how privacy laws will affect retailing and other industries at a national conference here May 24-25.

Participants will include David F. Linowes, chairman of the Privacy Protection Study Commission; Ronald Plesser, the commission's general counsel; and Ruth Davis, director of computer sciences and technology for the Commerce Department's National Bureau of Standards.

Further information and registration can be obtained through Privacy Conference, NRMA, 100 W. 31st St., New York, N.Y. 10001.

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Less Stringent Privacy Regulations for States Urged

By Nancy French
Of the CW Staff

SAN FRANCISCO – Privacy regulations – especially where information transfer is concerned – should be less stringent for states than for the Federal government.

Without the current information-sharing privileges, much of the work done by state agencies would come to a halt, according to John Lautsch, an attorney for the California State Universities system.

Lautsch pointed out that law enforcement agencies, for example, presently depend upon other operating agencies to inform them of violations.

The Department of Motor Vehicles alerts police when autos are stolen, and the Fish and Game Department contacts police about violations of fish and game rules, he noted.

Franchise tax boards tell law enforcement officials when tax statutes have been violated, he added.

"Modifying information transference in state governments without carefully considering the impact of the modification could have profound collateral effects on the operation of these types of agencies," he told attendees of the Computer Law Association's recent conference here.

State governments' use of personal information is more like that of American businesses than that of the Federal government, Lautsch explained.

State governments use automated personal information systems for on-line business operations such as licensing drivers or computing unemployment insurance benefits.

The Federal government, on the other hand, tends to use large-scale information programs to generate statistical information such as that used for policymaking by the Internal Revenue Service and the Social Security Administration, Lautsch said.

There is no doubt the public wants to see computerized information systems regulated, Lautsch said, noting that as early as 1972 California voters amended that state's constitution by popular referendum, elevating privacy to the status of a fundamental right.

CW
At CLA

The amendment, which focused exclusively on computerized information systems, said in part that "modern technology is capable of monitoring, centralizing and computerizing information which eliminates any possibility of individual privacy."

But laws modeled after the Privacy Act of 1974 are not the answer. "Already seven states have enacted some type of fair information practices statutes," he said, adding that 23 states have enacted laws regulating electronic funds transfer (EFT) systems.

In their haste, many legislators are making mistakes, he claimed.

Most are concerned with regulating the nature of the "gadgetry, the security arrangements, and establishing consumer rights," he said. Many enactments treat EFT systems as a "banking" phenomenon, and legislation is primarily aimed at amending branch banking laws, empowering the state superintendents of banking to prohibit operating EFT terminals except on conditions established by the superintendent, he said.

"But EFT has implications far beyond mere banking," he warned. Retail chains are extensively involved in extending credit to their customers through check cashing and credit cards.

Western Union and the U.S. Postal Service offer money by wire and money orders services, a type of fund transfer system that could be upgraded into an EFT system, he said.

"Would upgrades to EFT systems by the Postal Service and Western Union need to be approved under the regulation of the state superintendent of banking?" he asked.

Finally, most privacy regulations incorporate a means of allowing individuals to ascertain what personal information state agencies possess about them and the right to contest and amend that data.

The administrative impact of these provisions could have a devastating effect on an agency's organizational structure, Lautsch said.

Privacy Law Called Dangerous For Private-Sector Companies

By Nancy French
Of the CW Staff

SAN FRANCISCO – Omnibus legislation covering information-handling practices in the private sector is the most dangerous legislation private-sector organizations have ever had to face, according to William A. Fenwick, an attorney with Davis, Stafford, Kellman and Fenwick.

Many privacy proposals that will be voted on this year could paralyze business activities by interfering with established patterns of problem solving, he said at a meeting of the Computer Law Association here recently.

"Information gathering is a basic process of the continuation of civilization," he said.

Over the years many serious crises have been solved using information that originally had been gathered for other purposes, but most omnibus privacy laws would prohibit using information in this way, he said.

In addition, many of the state privacy bills, if passed, would slow down the already-cumbersome judicial process, he said.

While the Privacy Act of 1974 exempts lawyers seeking information for litigation, most state laws do not, he noted, adding

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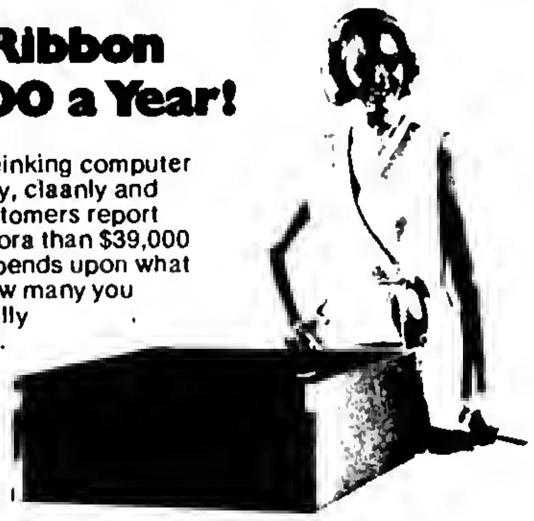

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When Crossing Borders

Laws Often a Factor in Net Decisions

By Nanch French

Of the CW Staff

SAN FRANCISCO – The user setting up a communications network that crosses state and national boundaries faces many tax and communications laws that make some of his equipment and procedural decisions for him, according to Landon Miller, DP manager for Nordstrom, Inc., a West Coast department store chain.

Laws have become so complicated that he has begun to work for a law degree, he told members of the Computer Law Association, who met here recently.

Nordstrom's communications network, established largely to authorize customer credit at some 600 point-of-sale terminals, faces tax challenges from the state of California, Orange County and the Canadian government, he said.

Its central DP installation in Seattle consists of an NCR 251 with 384K, front ended by a 48K NCR 725.

Reports were previously printed in Seattle and shipped in hard copy form over the border to Vancouver, he said. Now, however, the Canadian government treats print-outs as imports, for tax reasons, so Nordstrom's installed a printer in Vancouver and began sending the data over a leased line.

Now the Canadians are threatening to tax the data moving on the network, he said.

Another tax problem brewing in Orange County, he said, is taxation of software at market value – much like hardware is taxed, he said.

"Although we haven't any stores in Orange County at present, this could be a problem for us next year," he said.

"We would be using the same software in Orange County as we do in Portland," for example, he said, and our software actually resides in Portland.

CW
At CLA

The software would be in Orange County in the form of electronic impulses when the system is live during the day. However, when the system shuts down at night, it would disappear, he said. "What are they going to tax?" he asked.

Postal Regulations Pose Problems

Federal Postal regulations pose still more problems for Nordstrom's.

"Users can batch transmit data without violating postal regulations as long as the data is processed within 36 hours," he said, adding that presumably Postal Service delivery couldn't match this.

However, the user who doesn't process the data within that time period would be violating postal regulations 510 and 520, he said, and would be subject to postal charges. The details of these charges have not yet been worked out, however.

A California state law that forbids users chargeback for DP service has already caused Nordstrom's accounting problems, he said.

The state argues that DP services are taxable because the central DP department is providing service that otherwise would be purchased from an outside supplier, he said.

Nordstrom's, which has an electronic funds transfer (EFT) system by virtue of its point-of-sale terminals, could also be affected by proposed EFT regulations, he said.

Besides the NCR mainframe and front end in Seattle, the network consists of NCR 725 minicomputers in Anchorage, Alaska; Tacoma, Wash.; and San Francisco to serve stores in those areas.

The point-of-sale terminals are NCR 280-120s, he said.

Privacy Act Seen as Dangerous

(Continued from Page 4)

that "people are going to be pretty reluctant to talk to lawyers without a subpoena if by doing so they may be risking a year in jail or a $5,000 fine," he said.

"More injustice will be done using privacy as a justification than anything we have yet dreamed about," he said.

Today's emphasis on privacy is ironic, according to Fenwick, in light of society's history of dependence upon the scientific method and problem solving by gathering as much information as possible on a subject.

"We've made information a 'holy' subject," he said. "Society can't function without it."

The themes common to most privacy bills are the public notice, access and dissemination requirement and the prohibition on the use of a universal identifier, he said.

"Personal information has been defined as information about a person's finances, education, religion, health or anything done by or to that individual," Fenwick said.

Further, most bills call for a company to publicize the existence of files by mailing notices to data subjects and publishing the existence of the files in the local newspapers. "A company like General Motors would have to buy an awful lot of space to meet that requirement," he said.

As for the transfer of dissemination requirement, most bills deal with two types: routine dissemination and nonroutine dissemination.

Records of routine information transfers would not be required, he said, but detailed audit trails would have to be kept if anyone else sees such information.

"What a nightmare," he said. "The access record now becomes a personal record about the individual who saw the other individual's file and this record must be similarly protected," ad infinitum.

The laws also require companies to give people access to information about themselves, but how does a firm do that?

If people have the right to inspect their records, members of a dissident organization could come in asking to inspect their records and shut down the whole business, he said.

Finally, he said, it is the universal identifier that enables a recordkeeper to assemble the various parts of a record on individuals. If universal Identifiers are prohibited, how can a recordkeeper provide an individual with a complete copy of his record? Fenwick asked.

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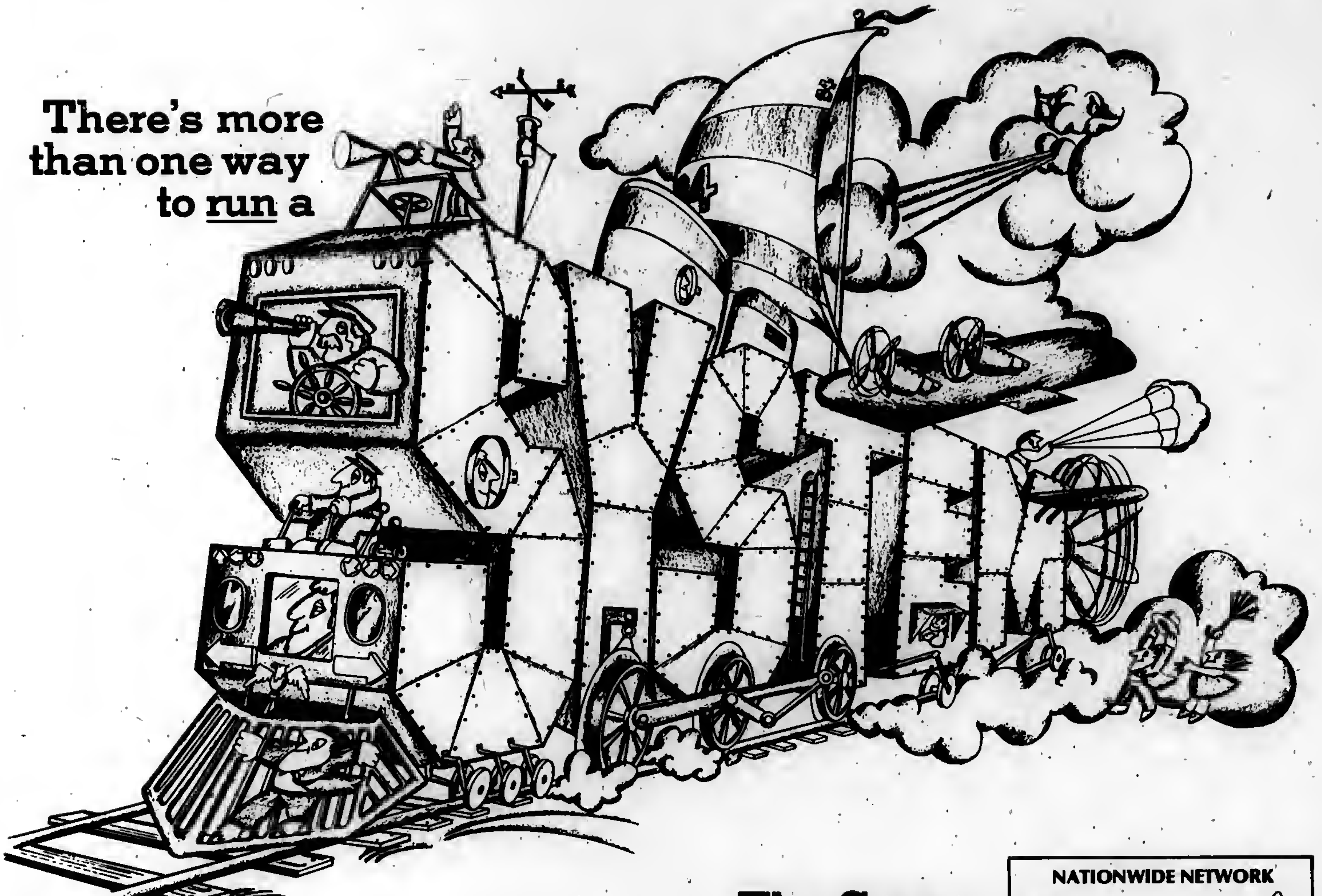

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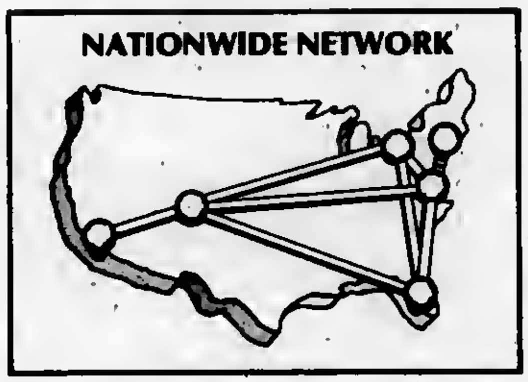

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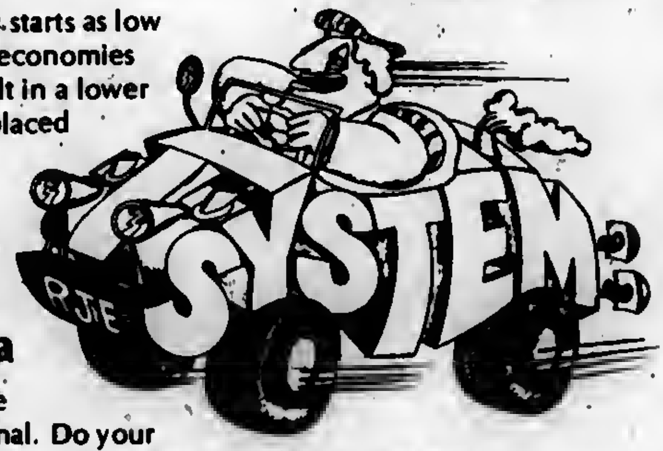

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There's more: fifty responsive software technicians maintaining and enhancing the system; freedom from juggling your own hardware all the time (to keep up with technology as much as capacity); and the nationwide communications network servicing high and low speed terminals. To top it off: you've kept your options open.

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Instead of installing a small computer, you might consider one of our Remote Job Entry Terminals as an **alternative.** The cost will be about the same.

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We believe that we have another responsibility: that is to make each systems implementation another step in building client-company expertise in data processing. We emphasize—through formal training and on-the-job example—the attitudes and disciplines of successful computer usage: the skills of system design, development, implementation and operation.

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To get the most mileage out of your resource we make available—at no cost—our proprietary products. Our *Systems Development Methodology* is used by some of the US's largest corporations. The *Master Series Software* system improves the productivity of system designers and programmers (over 100 units are in use worldwide). Over 1500 client staff attended MMDS/Hoskyns Training Courses last year: and our *Modular In-house Training System* is one of the leverage tools available to our RJE clients.

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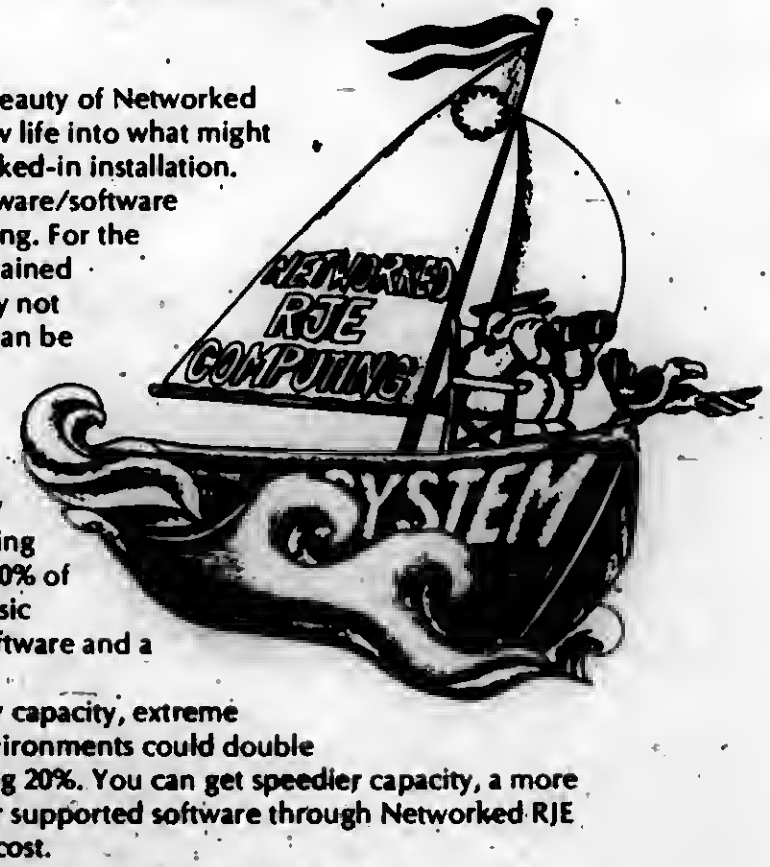

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Burroughs B80 Debuts With Two-Sided Floppy

(Continued from Page 1)

TD 700 and TD 800 input and display terminals provide data entry and inquiry capabilities for on-line communications, the firm said.

Besides the "super minidisks," up to six of which can be used on a B80, the system can accommodate disk cartridge drives with up to 27.6M bytes of data on-line. Industry-compatible minidisks and magnetic tape can also be used with the system, Burroughs added.

Printer Introduced

A 180 char./sec console matrix printer was introduced with the B80 system. Users can also choose to use a 60 char./sec console matrix printer and up to two line printers with 160- and 250 line/min speeds respectively with the B80, Burroughs said.

The B80 can have up to 11 controls for handling I/O devices, the firm noted, four of which are reserved for data communications. An automatic hardware interrupt system allows each I/O channel to notify the processor when data is ready to be processed so the processor does not need to continuously scan the channels.

When programs are to be executed, the MCP brings the interpreter, an organized group of microinstructions, into memory; individual interpreters serve the individual needs of each language, Burroughs said, so the B80, in effect, alters its logic for each language.

The MCP also supervises virtual memory capabilities and multiprogramming. Under virtual memory, only program segments needed for program execution are brought into main memory, enabling the B80 to execute a program that is larger than the operating system, the firm said.

The Data Base Bridging System "automates" the transfer of data bases from other small systems, including the B700, to the B80 using magnetic tape cassette.

BMS application programs introduced for the B700 and Burroughs L series are available for the B80, Burroughs noted.

A Commercial BMS II package for accounting applications, introduced with the B80, costs $4,000 with a monthly license fee of $200, the firm said.

A basic B80 system for $19,510 includes 32K of memory, two floppy disks with 1M bytes each, a 60 char./sec printer, one cassette drive and a system display. The system leases for $618/mo.

System software starts at $2,500, the spokesman added. Prices can range up to $150,270. Burroughs said from Detroit, Mich. 48232.

NCR Criterion Series Marks Architectural Departure

(Continued from Page 1)

- The use of fast emitter-coupled logic circuitry.
- A "pipeline" processor that performs fetch, interpret and execute functions simultaneously.
- A dedicated service processor which acts as a control center over three levels of diagnostics to check components and isolate malfunctions. A log that registers the last 16 transactions processed can be accessed remotely, the spokesman said.
- Up to 16M bytes of virtual memory per program.
- On-line program development.
- A high-speed direct memory access (DMA) trunk that plugs directly into the bus.

Criterion Software

Software for the Criterion systems includes a Cobol compiler. The Criterion Real Storage Software operating system provides for batch, on-line and multiprogramming executives.

A Virtual Resources Executive required for a virtual Criterion configuration will be available in mid-1977 and will feature virtual storage, a file access method and the Cobol virtual machine, NCR said.

Neat/3, Fortran, RPG and Basic, formerly available with the Century series, are also available for the Criterion systems, the vendor said.

Peripherals can include card readers and punches; line printers, paper tape readers and punches, a magnetic ink character recognition (Micr) sorter/reader, matrix printers and thermal printers.

Retail, commercial and financial terminals and CRTs can communicate with the system, NCR said.

Disk units with up to 200M byte/unit and an 806K-byte with transfer rate and a data module introduced with the Criterion models with up to 70M bytes of storage as well as magnetic tape can be used as storage media, the firm added.

A basic 8550 with 128K memory, 112 nsec processor, integrated 600 card/sec reader, 1,200 line/min printer and 200M-byte disk unit costs $258,950 or $5,900/mo under a five-year agreement.

The 8570 with 256K bytes of memory and a 56 nsec processor, 600 card/min reader, 1,200 line/min printer and 300M bytes of disk costs $458,250 or $10,300/mo on the five-year plan from the firm in Dayton, Ohio 45479.

'DOS/MVT' Can Handle 12 Tasks

(Continued from Page 1)

able of the same functions under DOS/MVT. Subtasks may, for example, attach other subtasks, use the time freely and use unique console prefixes to allow message identification. Subtasks may be canceled using the console identification or the subtask name, the spokesman said.

To aid in system reliability, many "hard wait" conditions – including CPU checks and fetch errors if they are recoverable – are eliminated, he went on. A stand-alone dump copies all memory to tape and restarts the system without an Initial Program Load (IPL), he said.

Communications Eased

Communications between the operator and the system have been both simplified and improved, SPI claimed. Information can be passed to a program, for example, via an OS compatible PARM facility without having to read control cards, the spokesman added.

An automatic task balancing facility adjusts internal priorities to the current workload. Looping programs do not affect this mechanism, since time-slicing is employed, he said.

A routine called Sage spools reader, printer and punch I/O for all 12 regions and jobs may be scheduled by priority within job class while each region may select its work from multiple classes.

Reports run through Sage may be printed in the conventional chronological order or grouped together and printed in customer, department or other sequence, he added.

DOS/MVT is only offered on a month-to-month basis for $500/mo. Although no discount is allowed for multiple sites, a 40% discount is available for multiple CPUs at the same location, the vendor noted.

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ACM Report Urges 10 Privacy Principles for Data Banks

By Nancy French
Of the CW Staff

LOS ANGELES – Just as the individual has a right to privacy, so does society have a right to information – but personal information systems should adhere to 10 basic principles, according to a recent report published by the Association for Computing Machinery's (ACM) Los Angeles chapter.

The report was based on studies of information-processing activities in the state of California, the Chapter's Ombudsman Committee on Privacy said, but noted its recommendations were not addressed strictly to government users.

No information system containing personally identifiable data whose existence is unknown to the data subject should be permitted, according to the report.

Individuals should be able to find out what information is stored about them and how it is used, the report said.

One-Time Mailing

Suggesting a one-time mailing to each data subject describing the purpose of the data bank as well as the amount and nature of the information maintained, the report said this information could then be followed by an annual announcement in the local media.

The report also recommended that personally identifiable data not be collected unless the information system is safeguarded by a level of security commensurate with the sensitivity of the information.

While it is unreasonable to expect every organization to comply with a universal standard, each firm should establish a security policy that has the full commitment of management and the support of every employee. Further, it should be constantly monitored to ensure adherence, the report said.

Security is "closely aligned with system reliability and cleanliness of design. A computer system that is easy to understand and uses relatively few mechanisms to accomplish its services is one that is more likely to be secure than a highly complex one where each different service requires an additional programming package or feature," it added.

Individuals should also have a reasonable means of finding out what information is stored about him and how it is used, the report said.

In fact, the Ombudsman Committee said an organization should take the initiative to inform data subjects voluntarily that this data is being maintained about them – especially if it seems that the individual would not be made fully aware of the facts as a consequence of normal systems operation.

As an example, the committee cited an individual's becoming part of a data bank as a consequence of applying for a loan or a job. As a solution, the committee suggested a central register of all data banks of personal information. The registry could be updated annually, the committee suggested.

Data should be kept within the organization that maintains it unless the individual has given permission for specific disclosure in writing, the report said.

Such permission could be revoked by the data subject at any time. If not revoked, it should expire automatically at the end of one year, it urged.

Personally Identifiable information collected for one purpose should not be used for any other purpose without the knowledge and consent of the data subject. This would minimize the risk of injury to an individual whose personal information is used for purposes that differ substantially from those uses he was led to expect, according to the report.

If personal information is demanded by a compulsory legal process, such as a subpoena, the organization maintaining the data should make every reasonable attempt to advise the data subject of that demand before handing over the requested data, the report suggested.

An Individual must be reasonably able to contest the accuracy, completeness, pertinence and necessity for an organization's retaining identifiable information about himself; able to have data corrected, amended or expunged; and assured, when there is disagreement about the data, that his claim Is noted and included in any subsequent dissemination of the disputed material.

Organizations that create, maintain, use and disseminate personally identifiable information must assure its reliability for the intended use and must take precautions to prevent misuse of the information.

Before creating a data bank of personal information, an information impact study should be made to demonstrate the need for the information as well as the relevance of the data.

Finally, an individual should have the right to have any personally identifiable Information removed from any file if the organization maintaining the file cannot show any legal, useful, specific and productive purpose for maintaining such information, the report said.

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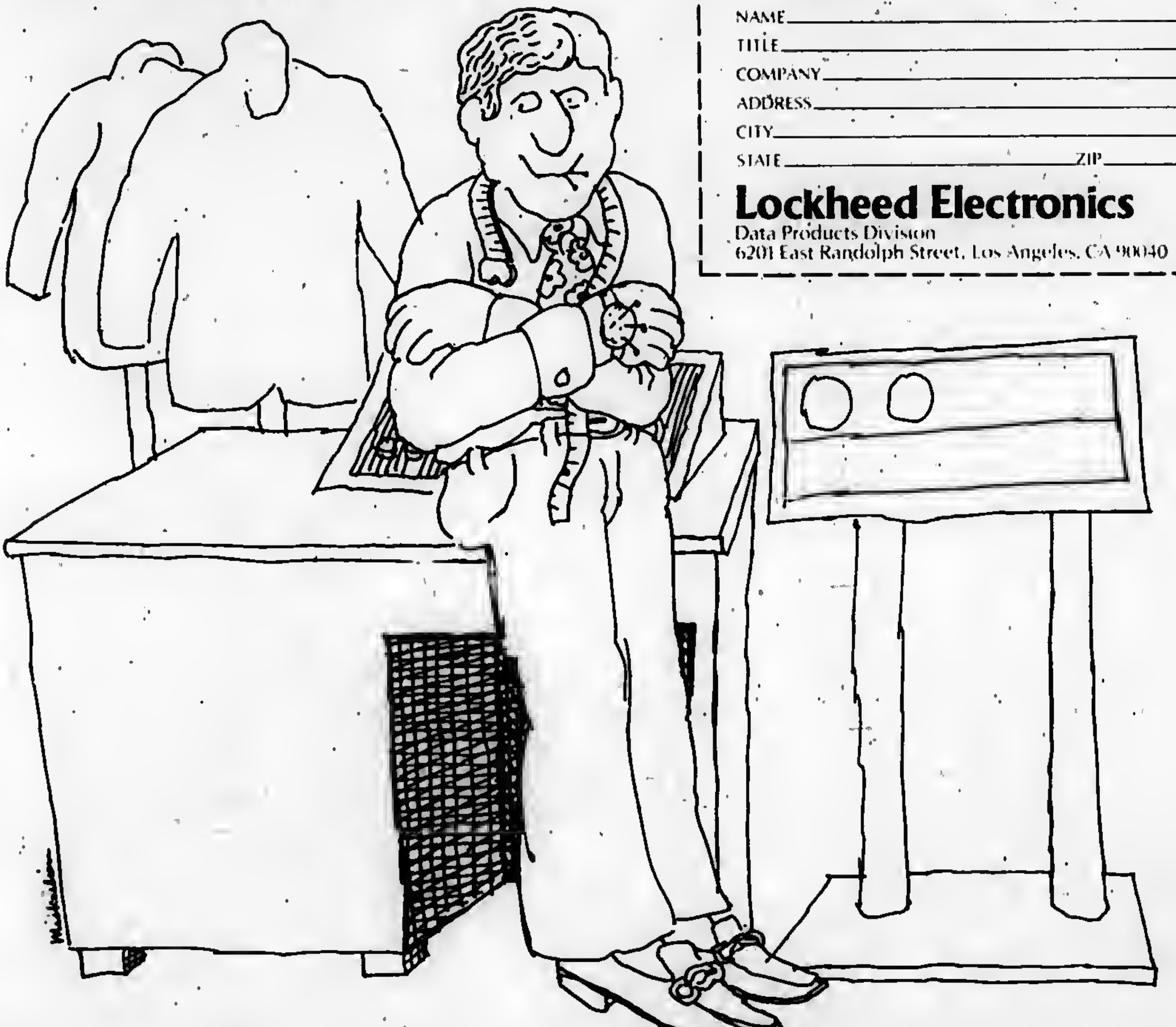

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Small Firms Moving to DP Told to Fit System to Need

By Don Leavitt
Of the CW Staff

DALLAS – The smaller the organization, the more careful it has to be moving into data processing.

The risk can be reduced, however, by "fitting a computer to a need instead of fitting a need to a computer," according to John Messenger of Lyda, Boyd Starr and Wilson, a certified public accounting firm.

Leading a workshop at the Computer Caravan here recently, the management consultant recited a list of ways in which organizations can get into data processing – through service bureaus, time-sharing or remote-computing networks or installation of equipment at the user's site.

But highlighting just how much hardware can and ultimately will be fitted to the user's needs, Messenger included microprocessors as well as minicomputers in his list of "in-house" equipment to be considered.

Micros are "just getting started, and 'you ain't seen nothing yet,'" he predicted, referring specifically to business-oriented uses of the small units. Once people understand what they really can do, they will have a number of special micros for special applications, he said.

Meanwhile, there are the more conventional options, he noted. Service bureaus, usually locally organized for "over-the-counter" batch work, come in "all sizes and shapes." These vendors can be good for high-volume jobs with heavy I/O requirements," but a user should check any of them out for stability and reputation before making a decision to go with them."

The time-sharing nets – "remote-computing really is a better term" – peg costs to usage but their biggest advantage over many local service bureaus is the bigger, faster equipment they use and the sophisticated program libraries they can provide.

Even installations with plenty of in-house equipment and staff expertise will utilize the networks for applications such as graphics and plotting, Messenger said.

Several Factors to Consider

While the means of automating applications exist in many forms, the organization trying to decide which, if any, to use must consider several factors, the consultant continued. Some might argue about the importance of some of the factors he named, he said, "but cost and management orientation have to be at the top of anyone's list."

In a small organization especially, human factors and how management is prepared to cope with them must be the primary concern. Big companies may be able to overcome human problems, but the smaller ones have to face the direct questions: Are the people who work there willing to accept change? Even if they are, what about their learning skills? Are they capable of making whatever changes are required?

Management obviously should be involved in the selection process, but not too deeply, according to Messenger.

Managers must realize that, whatever the choice, "the computer won't run the business," and the details of the selection process shouldn't tie up all a manager's time.

Costs can be both fixed and variable, he said, going on to his next major concern. With equipment and supplies "and even with people," there are costs at the front end of a project and costs that continue through the life of the system, he told the workshop. All of these must be included in any estimate made during planning, he added.

Part of the cost will go to the control function, and Messenger pointed to three levels of control that should be in a project no matter how it is implemented. In addition to accounting controls to validate the accounting information, there have to be internal controls to validate each individual transaction for coding, movement through the processing steps and final results.

But people maintain control, really, and the computer can't. That means, Messenger added, that management control supported by the computer is vital. And the only way DP can support his effort is to minimize the amount of paper coming out of the computer.

Specifically, output to the manager should be limited to exception reports for those areas for which he is responsible.

Concern for security is a new realm of concern for companies becoming involved with data processing. This includes proper care of programs and an awareness of the potential for fraud.

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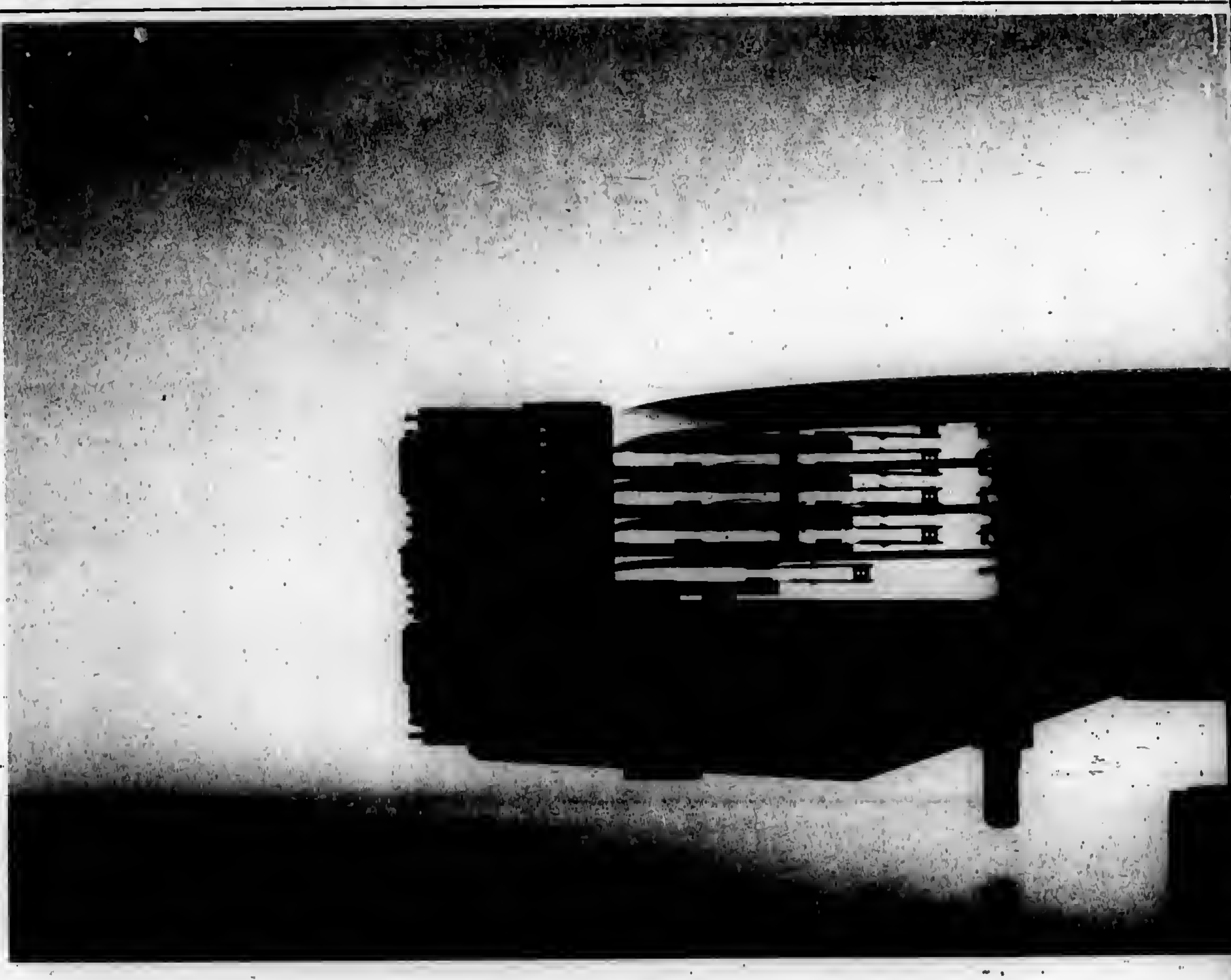

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Although Four Job Categories Dipped

Most Canadian DPers' Pay Envelopes Fattened in '75

By John P. Hebert
Of the CW Staff

TORONTO – The majority of employees at Canadian DP companies and sites experienced average salary increases in 1975 ranging from 2% for systems analysts to 18.6% for junior programmers and 21% for sales representatives, a Canadian Information Processing Society (Cips) survey found.

Four of the 37 job classifications, however, showed salary decreases of 1% to 8.5% compared with 1974.

The survey generated a 38% response to 3,000 questionnaires sent to companies and institutions listed in the annual Canadian Computer Census, to a number of companies that use terminals and to software houses, Cips said.

The survey related each job classification by industry classification, then by DP rental classification, then by province, it added.

Keypunchers Numerous

The majority of personnel represented by the survey in Canadian organizations were senior keypunch operators, with 2,388 employees. The next position with the largest number of employees was junior keypunch operators, running a close second with 2,269 employees, the survey showed.

Senior keypunch operators received an average 17% salary increase from 1974 levels to $8,535; junior keypunch operators realized an 18% average increase to $7,900, according to survey results.

Top DP management had an average salary of $27,521 in 1975, or 13.4% increase over the 1974 level of $24,262.

DP managers experienced a 14% increase to an average salary of $20,406; senior systems analysts and their junior counterparts were given 14% and 16% increases respectively, bringing their average salaries to $18,619 and $15,098, the survey found.

Junior programmers experienced the second highest average percentage increase at 18.6%, bringing their average salary to $12,196 in 1975 from $10,283 in 1974. Senior programmers' average salaries increased 8% to $15,042, the results showed.

Biggest Decline

Consultants and associate consultants suffered the largest average salary decreases in 1975 with 7% and 8.5% declines from their 1974 levels of $18,770 and $15,330 respectively.

Engineering associates and senior service representatives were the other two employee catagories which experienced decreases, with salaries falling 3% and 1% respectively to $13,428 and $15,511, the survey said.

There was a larger number – from 5 in 1974 to 61 in 1975 – represented in the 1975 survey for senior service representatives, however, which may have had the effect of biasing the results, Cips noted.

Sales representatives enjoyed average increases of 21%, bringing their salaries to a $16,612 average; sales management personnel also experienced average salary increases – of 14% – bringing their average salaries to $21,704, the results showed.

The highest paid employee in the survey had a salary of $42,003 and was a manager of all DP; those receiving a minimum pay for DP employees in a Canadian organization were senior keypunch operators, with a salary of $4,640.

Junior programmers ran a close second on minimum pay at $4,800, the results showed.

State Laws Detailed

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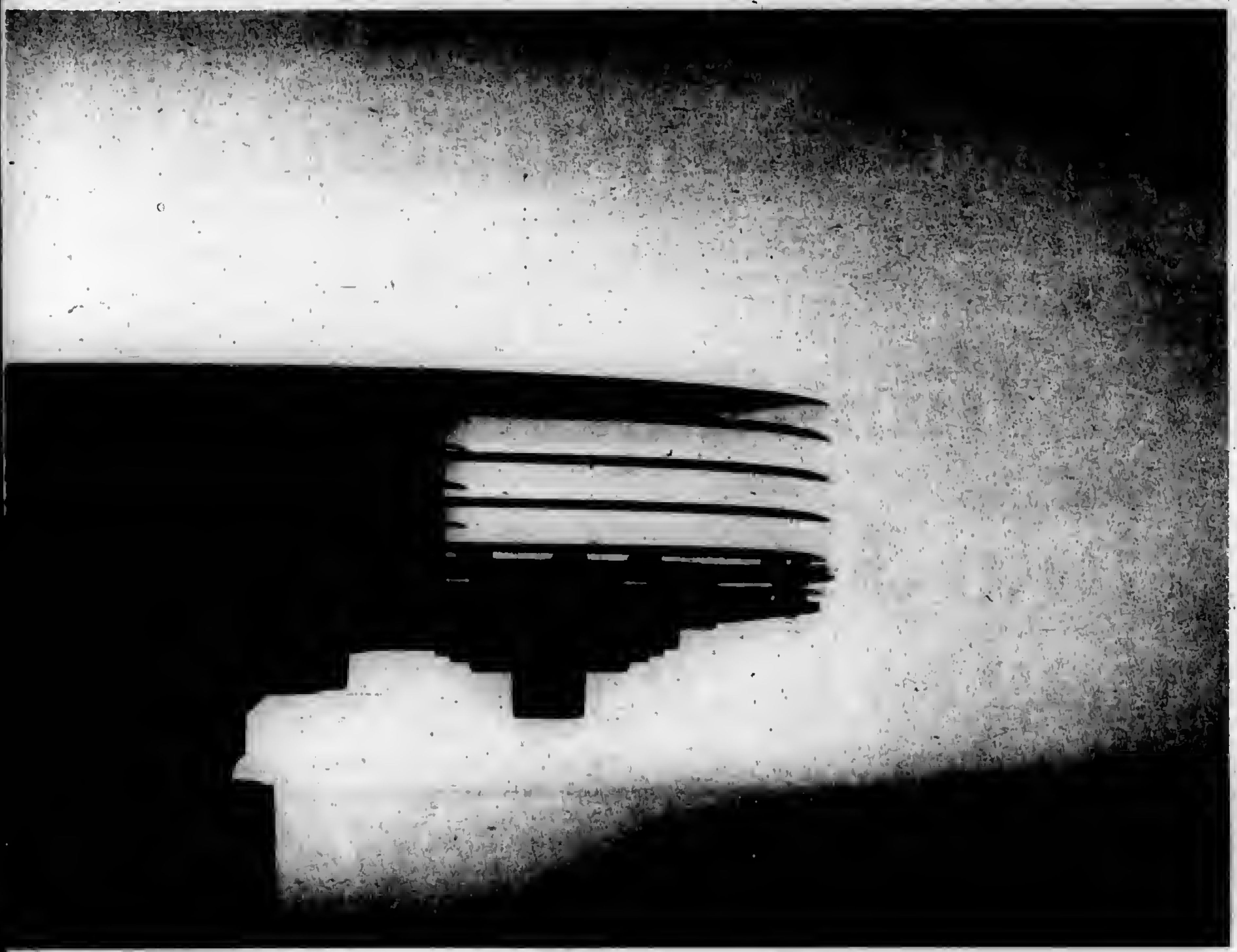

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Wanted!...

Every city on the Caravan tour has its own special flavor, but in Texas its more apparent than most, as this shot of one of our Market Hall guards shows. It was a pleasure to see this western tradition and to enjoy the relaxed hospitality that went with it. . . .In the other pictures, we tried to capture some of the things that went on in our Dallas visit, from Registration (A) to text editing (N), including: "the world's fastest printer", Honeywell's Page Printing System, being tuned up by Frank Zornes (C), and demonstrated by Marilyn Maleckas (G); magnetic media from Wabash Tape being demonstrated by Howard Beister (D); Linda Collins holding up her computer- produced portrait (B); demonstrations of a complete line of communications products and services by Don Smith of AT&T (E); "Silent 700" terminals and a new 990 family of microcomputers and minicomputers from Texas Instruments (F); Wang Laboratoies new processing applications software for its WCS small computers (I); Interdata's "Computer Life Support" systems being shown by Gerry Delaney (J); the Delta 4500 user programmable display terminal from Delta Data (K), Datapoint's complete line of processor-based terminal equipment (L); Houston Instrument's new 2400 line-per-minute, $3,000 printer (M); and text editing at Beehive, as John Cavarallo demonstrates the Edit Bee, one of several products in Beehive Terminal's Caravan booth (N). Beehive will be opening a Dallas Sales Office in June.

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...For your great, Texas-style reception of our Dallas show!...

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Editorials

Social Security Action Needed

Congress should take immediate steps to overturn recent authorizations it has made for the Social Security Administration (SSA) because they are for apparently unneeded computer facilities.

The Congress in a fairly routine action has given the go-ahead for the SSA to build a $2.3 million temporary DP facility; a $92 million facility in Baltimore; and a $69 million facility in Woodlawn, Md. [CW, Jan. 26].

In addition, SSA has ordered -- without competitive bids – four 370/168s that are now sitting in a warehouse and promise to remain there until at least the temporary facility is completed to house them.

At the same time, a study of the computer operations of the agency conducted by the General Accounting Office – and not yet publicly released – indicated that Social Security is presently using only 40% of the capacity of the 17 large-scale computer systems it has installed [CW, April 26].

So the administration is planning new hardware even when the old is nowhere near fully utilized – a clear waste of the taxpayers' money.

Congress should immediately investigate the situation in the SSA's computer operations and halt present building plans and computer acquisitions until that investigation is completed.

FYI

First in the Minds

Twice a year, *Computerworld* conducts advertising readership studies among its subscribers. Among questions asked in the 100 personal interviews conducted each time is a "share-of-mind" question.

This is one of the oldest and simplest concepts in advertising research and involves asking a respondent which company "first comes to mind" when a particular subject is mentioned.

A company's "share of mind" is no more than the percentage of respondents who mention a company when asked to name "the company first coming to mind."

It's generally accepted in market research that the larger a company's share of mind, the larger its market share, although there is no direct correlation.

So one way to tell where a company is going in market share is to test share of mind over time. If it's going up, then theoretically the share of market should be going up and vice versa.

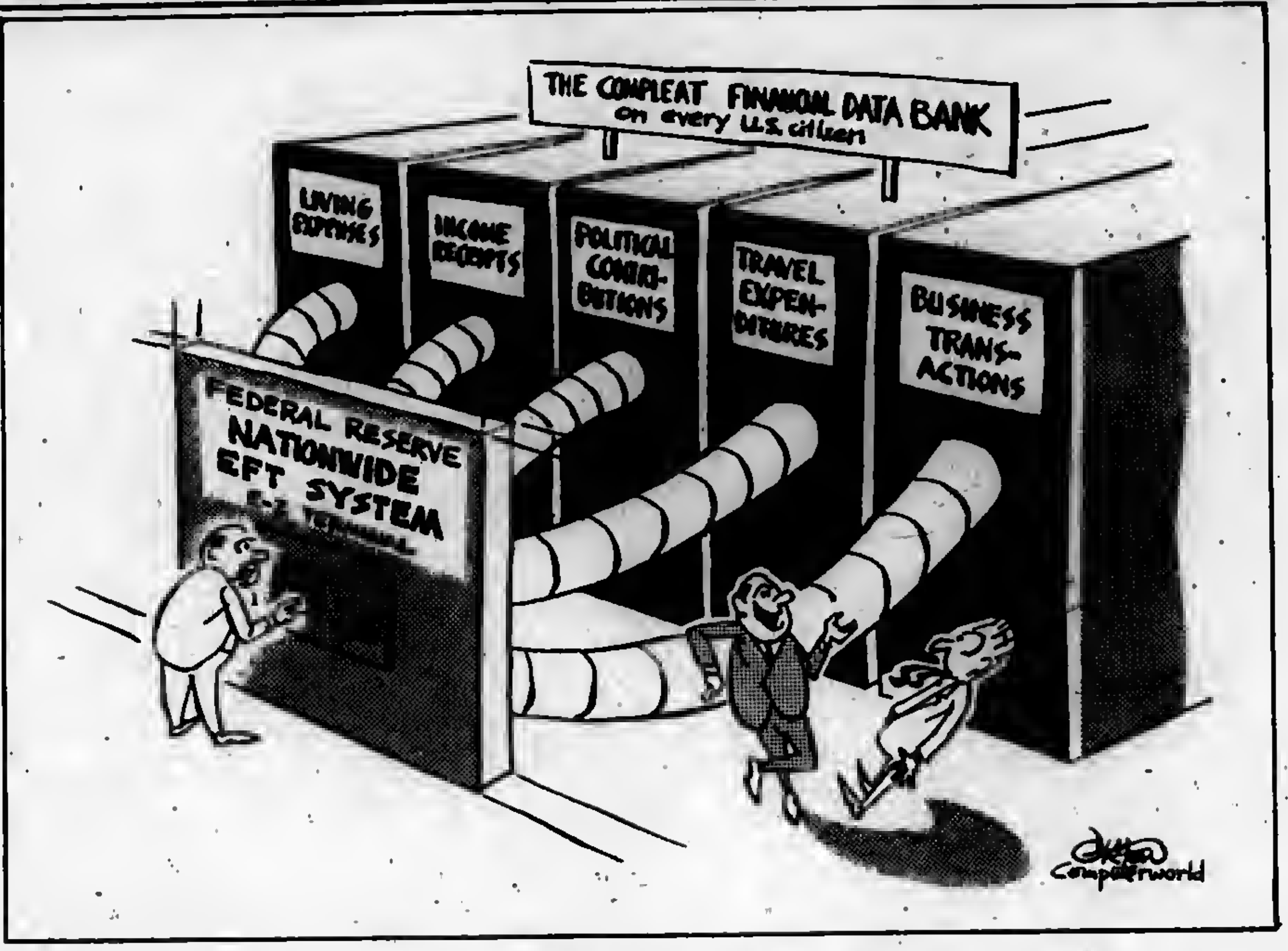
The results of our CW share-of-mind questions were an impressive show of IBM's overall dominance of at least the minds, if not the hearts, of computer users.

Share of mind was tested in 16 categories, and IBM was number one in seven of them, with a 50% or greater share of mind in four categories.

It also had three seconds, two thirds, two fourths and, in one category from which it was specifically excluded ("independent memory and processing peripherals"), it did not show.

No other company was in the same league; only two companies led in more than one category (Itel in leasing and used computers and Digital Equipment Corp. in minicomputers and miniperipherals).

No other company had a 50% share of mind in any category (DEC was closest with 45% in minicomputers), and no other company appeared in more than four categories, while IBM was mentioned in 15.



'Our First Project? Well, Up to Now, Everybody's Been Allowed to Compute His Own Income Tax . . .'

Letters to the Editor

Inflated SSA Time, Space Estimates Can Waste Millions in Tax Dollars

In supporting a wrong decision to purchase additional hardware, Social Security Administration (SSA) officials are now inflating time as well as space estimates for a system conversion [CW, Jan. 26].

As for the Model 30 programs, one approach that was not reported was that of program translation. For a changeover within the 360/370 systems, only the I/O coding would have to be changed, and I have seen translators do an effective job.

Programs could take full advantage of the larger system's capabilities, and the system overhead of emulation would be eliminated.

SSA officials must be made to understand that there are far more economical means available to increase operational capacity, other than by purchasing more machines. Their original decision must be reversed before millions of our tax dollars are wasted.

Mark Seigel

Brooklyn, N.Y.

Dissatisfaction a Surprise

It was with a great deal of surprise that I read in the April 12 issue of *Computerworld* the article entitled "School Buys Unit From Independent." Yvonne Dettloff, vice-president of Sawyer Business College, said she had purchased a printer from an independent supplier because she "was dissatisfied" with service on a Basic/Four Corp. system.

Upon checking our records I found some problems had indeed developed with the original printer after three years of trouble-free operations. After several attempts by our sister subsidiary, Sorbus, Inc., to repair the printer, it was determined that the printer had worn itself out. As most manufacturers know, it is not unusual for a printer to show wear and tear after such a period.

In 1975 Sawyer purchased a printer from an independent company and in the first part of 1976 it bought an add-on printer. Difficulties did develop with the system again and, upon discovering that Sawyer had violated its agreement with Basic/Four and Sorbus by adding equipment that was designated incompatible to the system, Sorbus did not want to accept the responsibility for repairing the system.

There are two sides to every issue, and the Sawyer story is nowhere near as unfavorable to Basic/Four and Sorbus as the article implied.

Donald Schnitter
Director of Marketing Services

Basic/Four Corp.
Santa Ana, Calif.

What Is a Systems Girl?

Herb Grosch's column, "Author, Author!" [CW, April 19] mentioned a "systems girl." This was in context with an IBM engineer and technical salesman.

What is a systems girl? Very few *girls* read his column, Many *women* do. Many of those are systems analysts.

Danielle R. Bernstein

Metuchen, N.J.

(Other letters on Pages 19 and 20.)

Data Past

Five Years Ago
May 5, 1971

PALO ALTO, Calif. – Salaries of programmers and other DP personnel rose in the last year, according to the most recent survey performed by Source EDP, a national placement firm. The survey results showed a 1% to 2% rise, differing from a survey conducted by Robert Half agencies which saw a 2% to 10% drop in DP starting salaries.

– – –

SANTA MONICA, Calif. – The Association for Computing Machinery (ACM) witnessed the birth of the ACM Special Interest Committee on Compumetrics to measure computer hardware efficiency, software efficiency and results.

Eight Years Ago
May 1, 1968

WASHINGTON, D.C. – The first nationwide telephone strike in more than 21 years threatened to but did not immediately affect data communications in the form of time-sharing services or other remote computer operations. The striking Communications Workers of America included 200,000 Bell Telephone System and Western Electric Co. workers.

– – –

WASHINGTON, D.C. – Votes by some 2 million students on presidental candidates and national issues were processed, totaled and analyzed for the first time by a computer in Choice 68, the national collegiate presidential primary. A Univac 1108 computer system handled seven types of data from each punched-card ballot, comparing and analyzing the voting.

Nine? No! Ten? Oh!!

I went to a most curious but well-attended meeting in Anaheim recently. Sponsored by the Los Angeles Section of the AIAA, American Institute of Aeronautics and Astronautics, in cooperation with the IEEE Computer Society software engineering committee and the ACM, it was called, "Software Management (Defense Systems and Other Federal Programs) – A Major Conference on New Government Initiatives." Billed as the most significant computer/software conference of the decade, which it surely was not, it had been given two weeks earlier across the street from the Pentagon. The whole cast then migrated to Disney Country and did it for us West Coasters: presumably it was cheaper to bring the mountain to six hundred Mahomets, almost all of whom were Pentagon pensioners!

Great dollops of *deja vu* were doled out. The theme was efficient software, and where possible less expensive hardware, in tactical and strategic applications. Not data processing, you understand – my old nemesis the Brooks Bill was supposed to have straightened that out some years back. In the role of Jack Brooks, singing the siren song of better procurement, better acceptance testing, better utilization, shared efforts and (you guessed it!) software standards, was Jacques Gansler, Deputy Assistant Secretary of Defense (Materiel Acquisition), Office of the Assistant Secretary of Defense (Installations and Logistics), Department of Defense. Jacques was sound – but so was Jack, in 1965. The song was sweet, the audience attentive; to somewhat paraphrase the old saw, contracts maketh a ready man. And the rustle of study money was audible on the dais several times.

But I wax unfairly critical. The DOD people, their henchmen from the Applied Physics Lab and Mitre (early, ah, rustlers?), a knowledgeable victim from TRW, and the audience itself were quite genuinely worried. They will fly *six hundred thousand* lines of specialized weapons and operations software in the B-1 bomber, and as large or larger a package in AWACS. The horrid Wimmix boondoggle (Worldwide Military Command and Control System) was presumably far vaster. And each line costs the earth to write and debug and activate and maintain.

Gansler and his associate Barry De Roze gave rough but terrifying estimates of $4 *billion* a year, Allah preserve us! That didn't count the hardware, you understand, the costs of which are likewise subsumed in aircraft and missile and nuclear-submarine and army tactical system budgets.

They want to do all the Right Things: analyze and validate requirements, plan and review acquisitions, improve estimation methods both for size and for cost, measure software performance more precisely, manage personnel – and standardize, of course.

Right here my *deja vu* (that's fancy for "Let me show you my bruises!") made me quiver like a giant gong. Shades of Dickens! I was Scrooge again, calling for Floor Equals Ceiling COBOL, and the ghost of Marley was rattling his chains. An apprehensive voice further back in the auditorium seat: No, no old ghost! Avaunt thee! Vamoose!!

"Nine." Nine! NINE? "Well, that's tentative," said De Roze, and listed three or four JOVIALs, a FORTRAN, a COBOL, and a bunch of mystery names that sounded like politicians' license plates. Of course the rationale was obvious: if you have an operational weapon, a "battlefield" artifact, with hundreds of thousands of lines of integral software, being upgraded and simplified and expanded and validated in some obscure Munchkin dialect, that language must survive. And there are dozens of such artifacts, from SAGE to the Airborne Pentagon, from Rickover to Startrek. So, nine!

But further horror was yet to come. Surely some consolidation, some translation, some reprogramming lay ahead? And of course, new systems are being proposed. What language will revisions and new stuff use? Well, there are things to consider like interservice rivalries, and supplier competition, and professional egos. So pull back the curtain: a tenth entrant; here she comes, Miss America – DOD/1!!

We saw it years ago in data processing, of course. FORTRAN had caught on; IBM and its late-Fifties competitors had candidate commercial languages; experts like Bob Bemer were writing feverishly. Zong! COBOL! Out of the blue – or out of the Pentagon, by Charlie Phillips, to be more precise. And twenty years later, we may have a replay: a brand new military software language.

There is a directive, DOD5000.XX (sic!) being issued. It will, along with the other Good Things, refer to this concept. Already an eager clan of contractors can be heard clamoring at the gates: "Let *me* write it! No, me!" The man to see is a light colonel named Bill Whitaker, in ARPA. He *likes* Higher Order Languages. Lots of 'em! Make him an offer.

But don't let me know. I can't bear it!

Herb Grosch

Readers Invited to Submit Results

Experiment Could Prove Error in Technical Formula

The Taylor Report

By

Alan Taylor, CDP

Robert Zenhausern of St. John's University in Jamaica, N.Y., has a problem. Some of his students have been getting wrong results – and not for any of the standard reasons.

They have been using perfectly good operational techniques and then analyzing their results mathematically on the computer, using standard software.

Unfortunately, it turns out the standard software is wrong. Not just one particular routine is wrong, but also the manual. Some textbooks also have taken a wrong approach to the question of split-plot variance.

Zenhausern knows the correct approach and realizes the errors must already have resulted in many, many studies being incorrectly analyzed. He wants this error to be recognized so that future studies will be performed correctly, so he has written a nine-page paper explaining the problem.

Now he has asked me where and how it should be published in order to gain the widest publicity. And the answer is that I know of no place where adequate publicity can be obtained. Computer papers, such as this one, are read by people who are computer people in the main. Mathematical journals, for it is a math problem, are read by math specialists. But books and routines, once published, distributed and copied, have an independent life of their own. I can't think of any single source which has the ability to handle this type of issue. So let us look at Zenhausern's problem.

Split-Plot Variance

When a study is performed – say of the reading, writing, arithmetic and singing scores of three students in each of three different classes – the results of the study are first noted. Zenhausern used the following illustration:

A S1 10, 16, 9, 15
S2 15, 13, 8, 19
S3 14, 18, 6, 20
A S1 9, 7, 17, 10
S2 12, 7, 15, 13
S3 11, 5, 14, 11
A S1 8, 9, 10, 4
S2 7, 5, 16, 3
S3 4, 8, 14, 6

The four numbers after each S1, S2 or S3 represent the B1, B2, B3 and B4 values for the specific A/Sn combination.

Now that is something with which you can work. Here is where publication can help. The problem, according to Zenhausern, is that these will be incorrectly partitioned if you follow some split-plot routines and texts.

There is the data he is using, so feed it into your computer or pull out your texts and see what results you get.

This way we will find either that no one else gets wrong results or that only the cases Zenhausern has discovered already are wrong or that more errors are floating around than anyone realizes.

Send the results – good as well as bad – to me, or to Zenhausern, together with details on how they were obtained, and we will be able to measure the scope of the problem.

As for the math problem, this is related to the error calculations that are performed during such an analysis. These are the calculations which determine whether the results of the experiment are worth using or whether they are inconclusive.

The test of the error is based upon the average sum of the squares between the observed and calculated results. This in turn is based upon summing the squares and dividing by the number of subjects.

Math people use two groupings to break up this type of question – "between" factors and "within" factors. A between factor is one in which a subject appears on only one level of an independent variable, while a within factor appears on all levels of the variable.

Zenhausern gives as an example that, when males and females are tested at several time periods after some treatment, time is a within factor, This is because all subjects are tested in each of the time periods – nine tests each if the tests last nine weeks and are performed weekly, for instance. Sex, however, is a between factor because any one subject can have only one sex.

The error is occurring right here, with the software and the texts apparently forgetting this and treating each subject as being able to have both sexes! This occurs because the error terms based upon the interaction (or product) of subjects and sex.

Following this rule results in wrong error terms, although just how wrong will depend upon how the number of "subjects" is chosen.

Are there, for instance, nine subjects when three students in three classes are examined in four areas? This would apparently mean there would be nine subjects multiplied by four scores multiplied by three classes, or 108 scores. In fact, there are only 36 scores.

Alternatively, are there only three subjects? This means that the system is treating three different students as a single individual and Zenhausern finds this untenable and able to destroy the validity of the calculated errors.

That then is the problem. The question is where is the solution? Zenhausern's answer is to publish, which is perhaps the best that can be done in this instance.

We in the computer field must wake up to the fact that, as computer routines become more and more embedded in texts and systems, we are vulnerable to such buried errors.

And then we must take appropriate precautions because we know of the potential hidden dangers. That is going to be expensive and will be fought.

But unless there is some way in which the faults currently embedded can, once located, be extirpated by publication or some other means, I see no way of avoiding this expense and keeping within our professional responsibility not to overstate our accuracy. Risking the use of routines with known but ignored hidden defects is certainly unprofessional.

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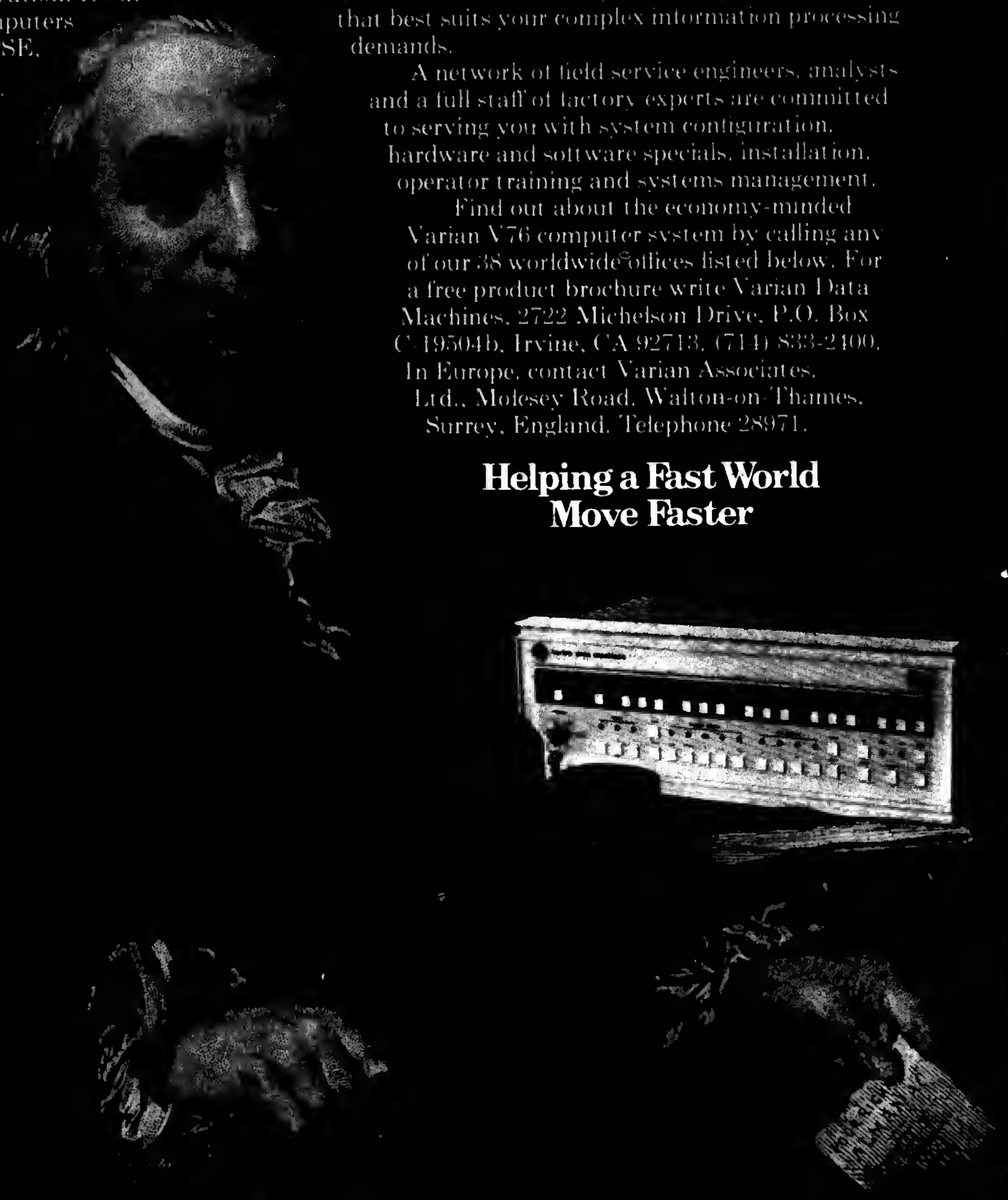

Varian Introduces The V76 It Remembers Time Is Money

The increasing demands of information processing obviously increases your computer time. And time is money. The V76 is a general purpose, microprogrammed computer system for scientific, industrial and data communications application. It outperforms the high class minicomputers such as the PDP-11/70, ECLIPSE, or the HP-3000.

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Letters to the Editor

Validity of Survey By SCDP Questionable

It was with some amusement that I read Kenniston W. Lord Jr.'s most recent attempt to convince the DP professionals of this country Certification Data Processing (CDP) is a good basis for licensing ["Holders Say CDP A Reliable Basis for Licensing," [CW, April 12].

If his belief in the statistical validity of his survey is any evidence of the knowledge required of CDP holders, the value of that certificate drops still further in my eyes.

The even dozen percent statistics cited in the article refer to percentages of 100 respondents (only 12-1/2% of those surveyed) who represent a mere two-thirds of 1% of the CDP holders, who themselves are a small percentage of the DP professionals in this country.

By surveying only Society of Certified Data Processors (SCDP) members, the results are already skewed in favor of the licensing proposal, in light of the fact that it is SCDP which is most vocal in this area – or is it simply Lord who is most vocal?

The low response rate among even SCDP members should say something about the true interest in this question. I wonder what percent of the total number of CDP holders might be in agreement with this silliness?

And what percent of all those of us in DP have not even bothered to pursue certification/licensing that far? Somehow the daily pursuit of knowledge and the ongoing work experience seem far more meaningful and useful than Lord's current mania for requiring every DP professional to get the same ego-inflating frameable certificate he has learned to love so well.

Somehow it is less than surprising that those people who hold the CDP and belong to SCDP would be most interested in licensing and in proposing the CDP as its certification medium. When only 9% of those people are sufficiently interested to respond affirmatively to this questionnaire, maybe it is time to consider whether we and *Computerworld* may not be giving this whole question far more attention than it is due.

David Martin
Wallingford, Conn.

Inviolable Property?

As chairman and toastmaster of the Homebrew Computer Club, it was my privilege to read Herb Grosch's column, "The Worm In The Apple," [CW, April 5], to the multitudes assembled.

The body was left in a stunned silence, however, at the suggestion that we little fish should set an example for Big Business and Big Government. Really, this is 1976.

The amateur computer folk are the first group of users (with the possible exception of educational users) who do not regard computer hardware and software as capital goods, intended for the purpose of making money. How many people have to pay a royalty to borrow a book from a library?

Grosch's implied characterization of the Homebrew people as thieves and/or shady operators has not been borne out by investigation, according to a report given at the same meeting.

That "counter-culture attitude" which Herb denounced is a little more complex than his characterization that "private property is obsolete." The uses to which a segment of the state of the art is applied seem to have some bearing on their status as inviolable property.

Lee Felsenstein
Berkeley, Calif.

Don't Blame DPers

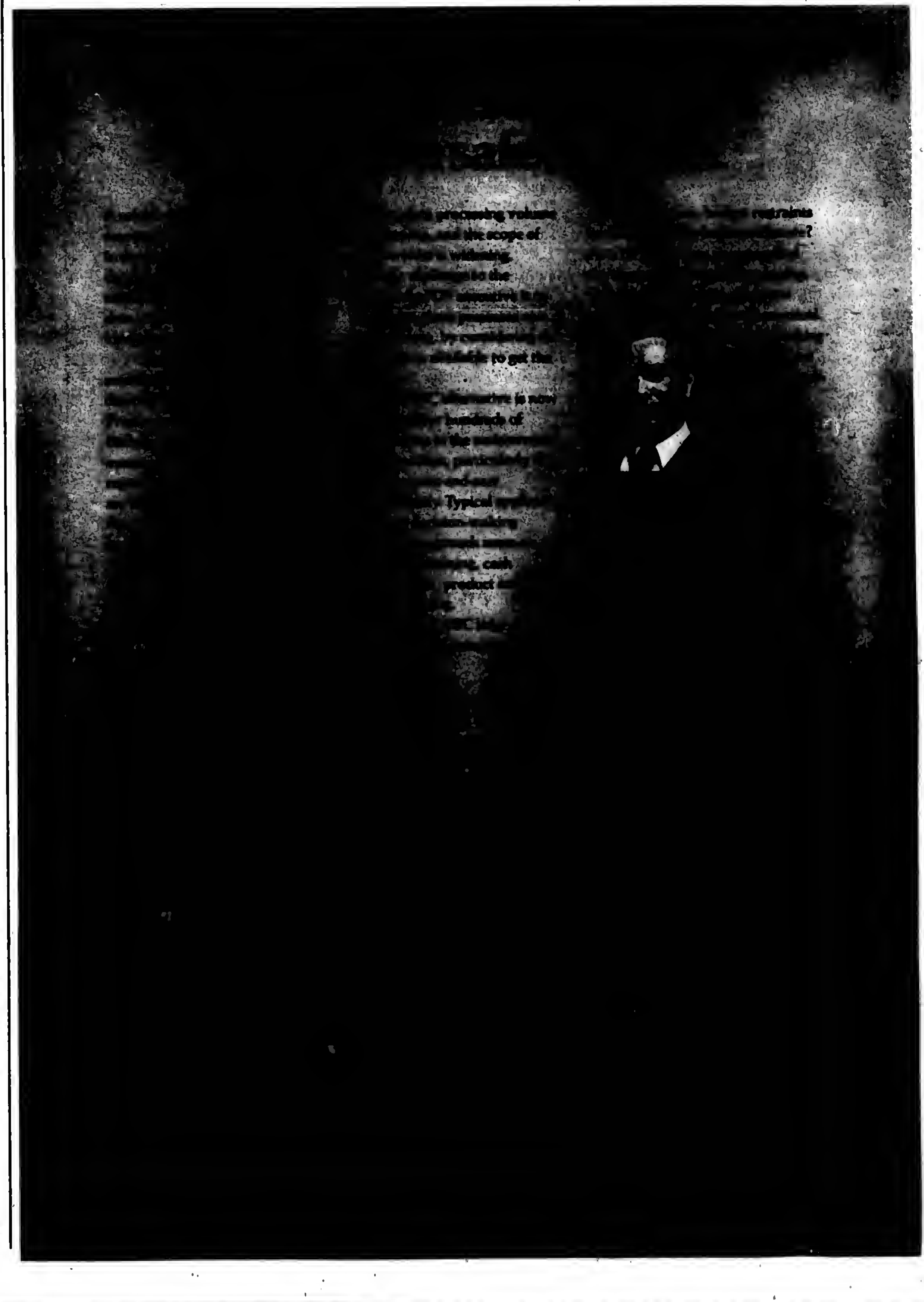
It would be well for Alan Taylor to apply to his writings the same sort of principles he espouses in writing for good systems design: knowledge of the subject, objectivity, accuracy and sufficient in-depth consideration of the subject.

Regarding the column, "'Second-Collision' Errors Can Cause Problems for DP" [CW, April 5]:

- A check is not "paid into" an account other than that on which it is drawn. It is, rather, deposited into another account and ultimately paid from the account on which it is drawn.
- A check being posted against the account it is drawn on for $7 rather than $700 will result in an excess in the account of $693, surely not causing any checks to "bounce." Virginia's rejected checks were no doubt due to the deposit into her account being encoded as $7, as well as the check against Norman's account.
- The entire situation in this example of a "computer systems failure" has nothing whatsoever to do with the bank's automated posting sytems. It appears to be a proof error, plain and simple.

The only point in the entire article that makes any sense at all is the obvious fact that the bank was seriously remiss in its follow-up to rectify the error, regardless of how it occurred. This, however, is a customer-relations type of problem and a staff training problem, not one dealing in any way with the design, installation or operation of computer systems.

H.J. Eaton
Reno, Nev.



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By Jim Harder
Manager, Tachnical
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Letters to the Editor

Date Checks in Year 2000 To Cause Many Disasters

I have to wonder how many thousands of programs living off date checks and/or date relationships will either come to a screeching halt or produce garbage results as the year changes from 1999 to 2000. I have already experienced the beginning symptoms of this disaster.

A bond maturity projections program in a system that my company maintains for a client recently went berserk producing negative projection figures. Examination of the program quickly revealed that 25-year projections based on a file date with the year recorded as 75 produced the erroneous results when the calculated maturity year became 00.

Also, I'm sure many have read about the 105-year-old woman born in 1870 who received notice to start kindergarten because the birth year in her school file record was maintained as 70. Subtraction of her birth year from the processing date year (75) determined her to be 5 years old.

I strongly advise that the program designers of today stop worrying about the few bytes being saved by specifying years as YY and start worrying about their good name being maligned when we turn the century. I know I won't be around by then, but will they?

Marvin Goldstein
Garden City, N.Y.

IBM Could Crack AT&T Nut

The purpose of *Computerworld* seems to be to promote equipment and services by any non-IBM vendor for the betterment of the users' and manufacturers' pocketbooks. The March 22 issue took two giant steps backward from the above goal.

The front-page story highlighted a proposed six-point consent decree between the government and IBM. Point No. 6 was "Bar IBM . . . from the communications business . . . permanently."

The first editorial in this issue asked "the very real question of who will provide the communications services that users need to run their businesses."

I think CW is becoming antiuser. IBM has the resources, talent and determination to crack the communications services nut wide open so that other manufacturers can expand their services and provide competition/competitive pricing.

Just as Xerox had to lower prices when IBM and others cracked the dry copier market wide open, AT&T would undoubtedly have to lower prices should IBM and others get into the communications market.

Richard R. King
Elmhurst, Ill.

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Sort Package Delays Blue Cross Shop's Disk Upgrade

By Don Leavitt
Of the CW Staff

SEATTLE – How much good can a software package do?

The answer obviously varies with the package and the installation, but Jim Stoneman, a systems planner at Blue Cross of Washington and Alaska (BCWA), has a clear picture of what an independent sort package meant to his ahop.

As a result of benchmarks and estimates of workload growth made during evaluation of two different non-IBM sorts, Stoneman found that, with one in particular, "we could put off purchasing new disks for some time.

"The original projections showed that delay could be almost a year and a half before we'd definitely have to upgrade," he added.

The disk upgrade, however, is coming sooner than the original projections indicated, but that's primarily because BCWA has changed its basic mode of operation by moving toward a data base management system and teleprocessing, both of which use disk heavily, he said.

Stoneman is satisfied with his choice, the Syncsort package from Whitlow Computer Systems. "In the seven months it's been here, it's performed better than we had anticipated.

"Except for our change in operation, we could have stretched the disk acquisition out to just about three years," he said.

BCWA isn't always pleased with packages, he noted, and the situation it faced before acquiring Syncsort did not, at first, even seem susceptible to a software solution. The company has an IBM 360/65 with 3330-type disks from Memorex, IBM 3420 tape drives and various other peripherals.

"We were using every byte" of the 1M memory on the system, but that didn't seem to be a problem. As the workload increased, the multiprogramming factor also rose until it was up to "around 5."

But operations was running into hang-ups as it went through the production cycle and the problem seemed to have a definite pattern. Sort steps were waiting for disk allocation – "essentially for disk space that just wasn't there."

Squelched First Impulse

Under those circumstances, Stoneman's first impulse was to add more disk, but he then thought out the problem further. "Seeing the sort/merge utility represented about 40% of the job steps through a production cycle," he decided to look for a software solution.

There was enough disk space to do the sorting, he reasoned, but it had been fragmented as the data base and on-line files grew. IBM's SM1 sort package, then in use at BCWA, could not work with the fragments, requiring instead contiguous space allocation.

Production's problems with job steps waiting for space were almost all with sorts and occurred often enough – "at least once a day" – so Stoneman evaluated both Pansort from Pansophic Systems and Syncsort. The study period covered a good bit of last summer, he said.

"Since the day we installed Syncsort, we have not had a single hang-up waiting for disk allocation on a sort in a production run," he continued.

"That is because [Syncsort] can use fragmented memory and include automatic use of secondary allocations when that is necessary," he explained.

'Turnaround Sorting'

Syncsort is very fast "partly because it will run a sort completely in memory if the file is small enough," Stoneman said, adding that Syncsort "will do this 'turnaround sorting' whenever it can, even if we didn't realize the input file was that small."

The Whitlow package uses balancing and switching techniques that "get the most out of the disk work areas" and it "comes up with much more efficient throughput, better data transfer and less CPU time [than SM1]," he said.

Currently BCWA's 360/65 is running "at about 42% of capacity" as measured in machine cycles by IBM's OS/PT1 monitor. IMS uses almost half the system's core, and the center is operational 24 hours a day, five days a week, under OS/MVT Release 21.8, with multiple console support and Hasp.

User-Built Utility Eases Upgrades From B300/B500s

BAKERSFIELD, Calif. – Installations moving from Burroughs B300/B500 systems to the B1700 and larger models of the B700 series can convert Assembler source programs to Cobol for the bigger machines with a translator package now available from Hopper, Inc.

Originally developed by Hopper, a steel products distributor, for its own conversion effort, Translator runs on the B300/B500 or, under emulation, on a B1726 or B1728.

Users can therefore start the conversion while their old equipment is in place and complete it after the new CPU has been installed, a Hopper spokesman said.

Working from either basic or advanced Assembler source programs, the package is said to be capable of generating "95% perfect" Cobol source code.

Translator itself is supplemented by pretranslation diagnostics and post-translation aids to minimize the user's own efforts, Hopper added.

The user has the option of providing substitutes for the Assembler names of constants, paragraphs and files so the Cobol output is as meaningful as possible. In addition, Translator permits the user to replace tape-oriented I/O files with disk-based data sets.

The Hopper Translator can convert Basic Assembler zone commands, address-modification operations, "address of" literals, test sense switch commands and mask operations, converting each into an equivalent Cobol construction, Hopper said.

Although intended as a Burroughs-to-Burroughs transition support, Translator may be useful also to installations moving from B300/B500 gear to other CPUs supporting Cobol. Used in this manner, however, the generated Cobol might need more user "tuning" before compilation on the new host.

The package is available under license for $7,000 from Hopper at 301 Espee St., Bakersfield, Calif. 93303.

File Access/Retrieval Options For RSTS/E Extended by 'Misam'

MONTREAL – The Multiple Index Sequential Access Method (Misam) allows users running under Digital Equipment Corp.'s RSTS/E environment to access records within files for retrieval, creation or alteration by one or a number of key fields, according to the package's vendor, MBI Data Processing.

Misam can be considered an intermediate step for users who expect eventually to move to a data base environment, MBI said.

Alternately, it can be a vehicle for users who do not wish to understand the complexities of a data base management system, but who find the limitations of DEC's IAM and Isam unacceptable, a spokesman added.

In addition to supporting multiple key searches, Misam includes various utility routines which allow a printout of accounting information about Misam usage. File reorganization is also provided by another Misam utility, the vendor said.

Misam logic was described as more efficient than IAM, operating in less than 8K words of memory regardless of how many programs are using it. On most commercial systems, it can be "locked" in memory to give fast response time, MBI added.

There are several limitations to the power of Misam, the vendor noted. These range from the requirement that all indexes must fit in 33M bytes to the fact that there is no management of the data file provided by Misam; it must be done entirely by the programmer.

Although Misam maintains a file of indexes, it is "totally divorced" from the user's data. Misam simply tells the user where the desired record is, based on previously stated keys; the programmer is responsible for actual data manipulation, if any is required.

Although the Misam package can be leased, MBI would rather trade its software to another installation "for something equally interesting," the spokesman said from MBI at Suite 1104, 1500 Ave. Atwater, Montreal, Quebec H3Z 1X5, Canada.

Package Generates IBM 3 OCL

HOUSTON – Operational Control Language (OCL) statements for an IBM 3 program can be coded in 30% of the time required for manual coding by using the Control Language Generation System (CLGS) from Diversified Services, Co., a spokesman said.

The system makes use of two RPG-like coded sheets on which the programmer enters file names and other functional parameters. From these, CLGS generates appropriate OCL procedures which are stored automatically in a disk-based library, the spokesman said.

The user may also pass into the library specifications for such things as sorts to be included in the operational OCL, he added.

CLGS includes its own error-checking routine, which eliminates many of the usual OCL coding problems, according to the vendor. Because the system generates the actual OCL, many spelling errors and other formatting flaws are avoided completely, the spokesman claimed.

CLGS runs on IBM 3 models 8, 10, 12 or 15. The minimum acceptable configuration is 12K memory, but the system runs more efficiently when at least 16K is available, according to the vendor.

The software is shipped on fewer than 2,000 96-column cards or on diskette.

CLGS is available now for a one-time cost of $300; the firm can be reached through P.O. Box 861, Houston, Texas 77001.

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Training Small Part of Personnel Development Plan

By Jack L. Stone
And Alexander P. Grant
Special to Computerworld

A typical computer center is conceived in crisis and developed in chaos. Those who survive generally reach some plateau of usefulness and productivity at least minimally acceptable to top management.

During this time of travail and developments, computer center management lavishes great attention on both the technological and the personnel needs of the center.

In many established computer centers, however, managers continue to concentrate on technological improvements to sustain and increase productivity; they generally avoid serious consideration of personnel development.

In such installations, the general level of personnel performance tends to deteriorate until the productivity of the center's work force is below that required to apply current computer technology in an effective and economic manner.

Faced with such a condition, a surprisingly large number of DP center managers seem to believe the only tool for improving personnel productivity is technical training.

Results Sometimes Negative

As vendors of DP training and personnel development services, we have a vested interest in fostering and encouraging such attitudes; however, simple honesty compels us to observe that an unfortunately large percentage of training activities do not result in better performance on the job.

This is one of a series of articles by these authors. In this article, Stone and Grant highlight some of the ways in which motivation affects the effectiveness of people in a DP center. In the next, they will focus on the role of the operators and how management can support and encourage them.

Unsatisfactory training outcomes may, in part, flow from poorly designed or poorly executed training programs, but are more frequently chargeable to other factors.

One of these factors is that managers and supervisors often do not fully recognize it takes more than training to move people to produce. The employee must want to produce; he must be motivated to produce.

It is important to recognize here that motivation for productivity is not necessarily the same thing as high employee morale. An employee who is diligently extending his own knowledge and skills may have excellent morale, but he is not necessarily the most productive worker in the center.

The worker who accepts training reluctantly and always has a gripe may, on the other hand, produce at a high level.

Management Responsible

Motivation for productivity does not arise in the work force simply because the managers and supervisors are "good guys," nor does it stand alone as the only requirement for achieving improved computer center production.

Simply stated, development and utilization of human resources in the DP center is a management responsibility that can be dealt with in the same planned, orderly and reasonable way in which other management responsibilities are approached.

Peopleware

The resources and tools available to the manager for improving the productivity of his people fall into three categories:

- Standards, policies and procedures that facilitate the evaluation of organizational and individual capabilities and productivity.
- Organizational, job and career structures that promote both organizational effectiveness and individual growth in productivity.
- Personnel development programs that take into account both the needs and goals of the individual and the operational needs and objectives of the computer center.

Important Questions

Attainment of the objectives of improved employee productivity requires the computer center management team to recognize and deal with all aspects of human resource management. Too often, however, the immediate crisis prevents meaningful consideration of such management responsibilities.

For example, when was the last time

(Continued on Page 23)

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DEC Users Gain Fortran CSP

MANLIUS, N.Y. – Introduced by Manlius Valley Enterprises, Inc. (MVE), a Commercial Subroutines Package (CSP) for Fortran IV users working on Digital Equipment Corp. PDP-11 equipment is code-compatible at the source level with IBM's 1130 CSP and Ideal packages, according to the vendor.

In those cases when routines in the earlier IBM packages are redundant in purpose, the better of the two was selected for inclusion in the MVE package, an MVE spokesman claimed.

Any routine that is unnecessary – because of the increased power of the PDP-11 instruction set or the "unlikely inclusion of a particular device" in a PDP-11 configuration – was not included in the MVE packaging, he added.

The MVE package will function on any PDP-11 capable of supporting Fortran IV. A perpetual license costs $1,000.

The object code is distributed on paper tape, DEC RK cartridge disk or RX01 diskette, the vendor said.

MVE can be reached through P.O. Box 232, Manlius, N.Y. 13104.

'Alert' Split Gives User Choice

ROCKVILLE, Md. – The capabilities of the Alert performance analysis package have been split by Comten's Software Products Division so that users may acquire only the particular tool they feel will help them most.

Alert works with IBM's SMF data, but differs from most other data reduction packages by presenting both tabular and graphic data and a narrative description of the situation they illustrate. The situations on which reports are generated are user-selectable from a "menu" of some 40 possibilities.

Now the package has been split into the Performance Analyzer, which pinpoints specific inefficiencies at the system, program, job and data set level, and the DASD Management System which provides both space and usage measurement of direct access volumes and data sets.

As in the past, the Performance Analyzer is an exception reporting system which includes narrative explanations and recommended corrective actions as part of its reports. Some applications are in centralized performance audits, performance evaluations and in operations quality control, Comten suggested.

Under the DASD Management System, users are provided data for determining off-line vs. on-line status of files, for identifying inactive data sets and for planning and controlling DASD capacity. Customers have recaptured as much as 20% of their DASD space using this software, the vendor claimed.

Alert runs on IBM 360/370 systems with OS/MT or MVT, OS/VS1 or VS2..

Basic license fees for each of the two Alert pieces is $8,900, but options may increase those fees substantially. Basic fee for both halves or what is in effect the full basic Alert system is $14,000, Comten noted from 2 Research Court, Rockville, Md. 20850.

Motivation Key to Development

(Continued from Page 22)

your computer center management team convened as a group to ask and find answers to such questions as:

How much of our daily quota of problems comes from shortfalls in the job performance of our people?

Do our people really understand their jobs and their roles on the DP team?

Do they have the knowledge and skills required by their jobs?

Do they have the attitudes and motivation to work to support the objectives of the organization?

Do our people have the understanding and communications skills to interface effectively with the outside work, i.e., users, top management and others in the organization?

Do our supervisors and employees have mutual respect for each other?

Exercise of Functions

Adequate supervisory attitudes and skills are necessary but not sufficient support for an effective human resource management program. Another important ingredient is a personnel development program that serves both the individual and the organization.

Development and execution of such a program calls for exercise of a number of management/supervisory functions. First, management must objectively evaluate each individual employee in terms of his skills and knowledge in relation to his job.

In addition, the individual must be assessed in regard to his attitude toward his job and the organization; his future job goals; and his contribution to supporting the organization's productivity objectives.

Second, management has a responsibility for participating with each individual in the generation of a realistic personal development plan that is consistent with both the individual's and the organization's needs and objectives.

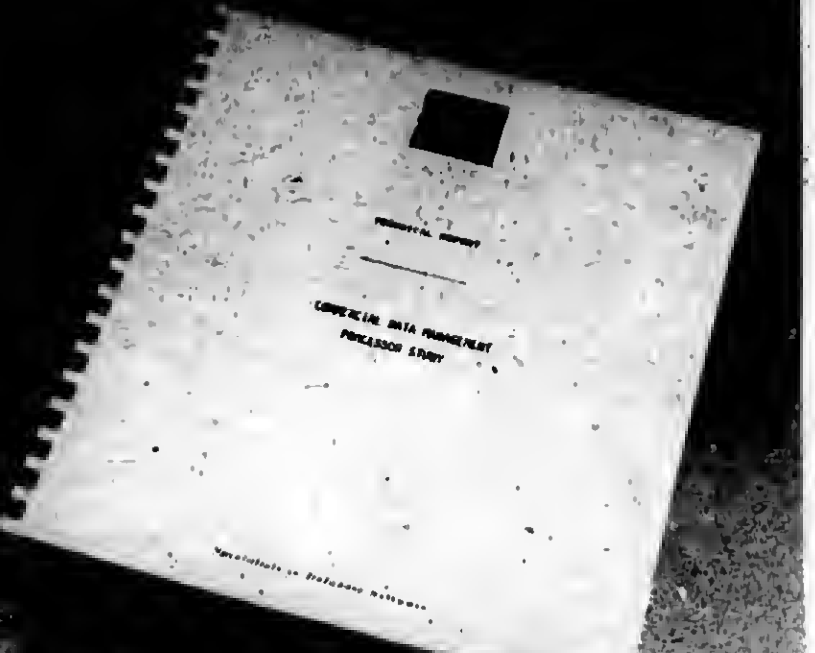
The plan should include all activities that are factors in the individual's career progress, including current and future work assignments, formal training, on-the-job training and participation in management/employee committees, workshops or other participatory management programs.

Further, as the plan unfolds and the individual progresses through the plan, periodic checks must be made to evaluate progress toward the plan's goals and to revise the plan in the light of changes in either the organization's or the individual's situation or objectives.

Third, job-oriented effective training programs must be developed and implemented. Such training should be available as needed for all employees in the computer center. Each course developed must be clearly and proximately related to the operational needs of the organization.

Finally, policies and procedures that assure good internal communications are needed to prevent misunderstanding and lack of information from negating improvements in productivity that have been achieved by other facets of the human resource management program.

Stone is the managing director and Grant a senior associate of Computer Education International, Inc. in Washington, D.C.



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COMMUNICATIONS

Net Developed In-House Keeps Bank's Costs In-Line

By John P. Hebert
Of the CW Staff

BUFFALO, N.Y. – After embarking on a fruitless search for an automated loan authorization system, a large bank here decided to develop its own.

The system was made necessary because of a financial squeeze two years ago when the prime lending rate shot upward, according to Alan Wiles, vice-president of computer operations at Liberty National Bank and Trust Co. (LNB).

A Teleprocessing Loan and Authorization System (Atlas) is completely automated from the initiation of the credit application through the printing of a magnetic ink character recognition (Micr) book.

The Personal Loan Center portion of LNB, as a user of the bank's services, developed Atlas to try to reduce paper and people costs, William S. Galvin, assistant vice-president and coordinator of Atlas, said.

The bank had been put in a "tenuous position because of the legislative caps on how much it can charge for loans," Galvin said.

LNB used the services of Computer Task Group, Inc., a local software company, to help out the design of Atlas, he said.

The system has been up since last December, working from LNB's Personal Loan Center located in nearby Amherst, N.Y., and communicating credit and discounting information to LNB's IBM 370/135 mainframe over private phone lines at 4,800 bit/sec, Wiles said.

The 370/135 supporting Atlas works in an IBM DOS/VS, Customer Information Control System (CICS) environment, Wiles said, adding that the system "is one large CICS application."

Applications Phoned In

Customer loan applications are usually phoned into the system – which accepts installment loan, Master Charge or line-of-credit applications – from any of the bank's 45 branch offices or area dealers.

The application is entered into the system by an operator with a headset working at one of six IBM 3277 CRT terminal stations in the Personal Loan Office, Galvin said.

Atlas has "disciplined the information coming into the system" so the bank can have it in a certain format, Galvin noted.

The formatting is accomplished immediately after input. Then an on-line credit inquiry is made simultaneously with an on-line search of in-bank active and closed account files over the dedicated lines. The system has a typical response time of 1 to 2 sec, he said.

All of this information is then relayed to a person who reviews it and then enters a decision into the system through another CRT. Any limits or restrictions on the loan are also entered at this time.

The information is then entered into both an IBM 3286 printer terminal and a General Electric (GE) teletypewriter terminal by an operator who is prompted for loan applications which need completion and for format by an IBM 2740 terminal connected to the CPU in Buffalo, Wiles said.

The GE terminal, which LNB "has had for years," communicates a credit inquiry to TRW, Inc. in Anaheim, Calif., he said.

There is no direct interface between Atlas and TRW because of problems on the technical and legal ends, Galvin noted.

Printer Used as Backup

The 3286 printer is also used as a backup device if the system or the dedicated communications lines to Buffalo go down, Wiles added.

Upon approval, Atlas stores the transaction information until receipt of the contract or for a period up to 90 days, Wiles said.

(Continued on Page 25)

FCC Seen Limiting User Choices

Bell Asks Review of Dataspeed Tariff Rejection

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T has asked the Federal Communications Commission (FCC) to review the recent rejection of its application to tariff the binary synchronous, clustered version of the Dataspeed 40 [CW, March 8].

The rejection by the chief of the common carrier bureau of the Dataspeed 40/4 CRT terminal will "drastically limit the public's choice of service and equipment," AT&T said.

According to Bell, the rejection included definitions of communications and data processing which are not in keeping with previous FCC findings. "To reach its [decision] the Bureau has created an entirely new and novel definition of data processing which relies on factors unrelated to the functions performed by the Dataspeed 40/4," AT&T said.

Dataspeed 40/4 does not add any new functions to those performed by earlier Dataspeed or teletypewriter offerings and it "simply provides improved ways of carrying out the existing functions," AT&T said.

The proposed tariff for the 40/4 had been challenged by the Computer Business Equipment Manufacturers Association (Cbema), the Computer Industry Association (CIA) and IBM. Cbema told the FCC that the clustering features together with new control keys and the synchronous transmission capabilities of the CRT terminal made the 40/4 primarily a DP terminal that in many ways was similar to the IBM 3270 CRT.

In its latest request for review by the full commission, AT&T said the cluster capability was simply a way that several 40/4s can be connected to one phone line. It did not discuss the intelligent control functions provided by the minicomputer cluster controller in the 40/4 system.

The rejection of the Dataspeed 40/4 was based on the decision that the CRT terminal is an integral part of a data processing service involving the programmed interaction of the terminal and a CPU. If a carrier provides a service which utilizes such equipment, it is performing data processing.

But this definition hinges on whether the messages transmitted by a particular terminal are intended to be directly received by the computer without the need for human intervention, AT&T said. "This is a distinction without any practical significance. A message may be received in a number of different ways and still be transferred immediately to a computer for data processing."

The manner in which a data message is received can vary depending on the desires of the customer and the type of equipment he finds useful, AT&T said. The Bell statement referred to a 1961 IBM document on data transmission terms and teleprocessing products to demonstrate that IBM classifies its terminals as data communications equipment rather than data processing equipment.

Surely it is unreasonable and impractical for definition of data processing to depend upon the way in which a message is received, AT&T told the commission.

According to AT&T, the 3277 CRT terminal from IBM has been described by IBM as "a communicating terminal" despite the fact that the FCC rejection referred to it as the type of equipment which provides data processing.

AT&T said the bureau chief had exceeded his authority in rejecting the 40/4 tariff and it asked that the full commission reconsider the matter and allow the tariff to go into effect. If there are further broad questions to be resolved, an inquiry should be initiated after the tariff goes into effect, AT&T said.

Cbema filed a further response with the commission which said that if the tariff is approved it reserves the right to challenge AT&T's cost justification figures for the CRT terminal.

IBM asked the FCC to extend the time in which it can enter a statement. The FCC extended the deadline for any interested parties until the end of April. After this the FCC staff will submit its recommendation to the commission.

Among the options available to the commission are to affirm the rejection, overturn the rejection, modify the original ruling, or set the matter for hearing. It is not known when the FCC will vote on the matter.

CDI Adds Portable T/S Terminal

BURLINGTON, Mass. – Computer Devices, Inc. (CDI) has introduced a portable time-sharing terminal in its Miniterm line.

Called the Model 1203, the terminal can operate in teletypewriter, typewriter or numeric-only mode at 10-, 15- or 30 char./sec with all modes switch-selectable.

The acoustically coupled terminal has a thermal printer that operates with a 5 by 7 dot matrix character at 80 char./line with 6 line/in. vertical spacing.

The Model 1203 operates in local mode or half-duplex and full-duplex and is available with a buffer memory that allows faster transmission at 120 char./sec.

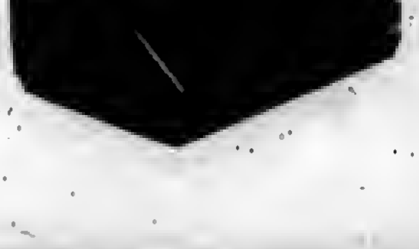
The acoustic coupler includes a modem that is Bell 103/113-compatible. An RS-232 interface is standard and two- or four-wire current loop interfaces are also available as options.

The terminal prints 96 characters from the Ascii character set and both upper- and lower-case characters can be generated when in typewriter mode.

User features include a lighted print page and provision for a spare roll of paper in the unit's carrying case. The complete unit is said to weigh about 18 pounds.

The Model 1203 costs $2,185 with a one-year warranty. Lease rates for one year are $125/mo, for three years $105/mo and for five years $95/mo. Third-party maintenance is provided by Olivetti. First deliveries are scheduled for July. A receive-only version without keyboard is slated for introduction later this year.

CDI is at 9 Ray Ave., Box 421, Burlington, Mass. 01803.



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(below) *AJ 841*, the rugged Selectronic™ printer terminal. A cost effective replacement for the IBM 2741.

(right) *AJ 230*, a mobile acoustic Teletype terminal. (Also available in auto-answer TWX/DDD versions).
(below) *AJ 630*, a 30 cps quiet, non-impact printer terminal with 140 character print line. (APL is an option.)

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Digital Systems Adapter Links Lear Siegler ADM-3, IBM 3

FREDERICK, Md. – Digital Systema Corp. has an adapter which allows Lear Siegler, Inc.'s ADM-3 dumb terminal to communicate with an IBM 3 computer.

The ISC Model 1 terminal adapter is said to include both the hardware and software necessary to provide two-way communications.

The adapter enables communications to the usually bisynchronous IBM 3 from the asynchronous ADM-3, according to Digital Systems.

Although the ISC Model 1 does not support bisynchronous communications, it reportedly does not interfere with any bisynchronous peripherals communicating with the IBM 3.

Reformat Option

The Model 1's functions include the option of reformatting input by means of field separator characters; code conversion from Ascii to Ebcdic; and conversion from lower- to upper-case letters on input, the company said.

The adapter's features also include the ability to link subroutines to allow RPG-II and Fortran "easy access" to the terminal and the ability to overlap terminal functions with other computer activity, it said.

The ISC Model 1 is priced at $3,950, Digital Systems said from 10 West College Terrace, Frederick, Md. 21701.

In-House Net Keeps Bank's Costs In-Line

(Continued from Page 24)

Declined loans are eliminated from the system and a computer report is made of all necessary data for the preparation of a letter as prescribed by the Fair Credit Reporting Act.

When the completed contract is received from the dealer or branch, the system verifies the annual percentage rate, finance charge, life and disability insurace.

It also computes the dealer reserves, crossfoots the amount financed, indicates the total payments and assigns an account number. If an error in the contract exists, the program identifies it.

Legal Controls

Legal controls are built into the system so that when an entered loan exceeds the legal guidelines of rate, term or proceeds, it will be rejected.

Atlas also provides a report of all applications whether they were approved, declined or qualified. This report data is categorized by branch or dealership and can be refined to reflect an individual salesman's or branch officer's volume and percentage of approved loans,

Cost Savings

Atlas wasn't designed for cost savings per se, Galvin explained, although there are considerable paper cost savings and a savings from the transfer of four employees who had accomplished the checking portion of the credit system manually.

The system has met all of LNB's expectations, Galvin said. There were few problems encountered with the system other than normal start-up problems and minor modifications in the screen format, he said.

LNB is planning to offer the loan authorization system software package to other financial institutions, Galvin noted.

Those interested in Atlas can reach Galvin at LNB's Personal Loan Center, 3275 Sheridan Drive, Amherst, N.Y. 14226.

Board Lets Terminet 120 Run With DG, DCC Minis

MINNEAPOLIS – Customer Systems, Inc. has introduced an interface board designed to allow a General Electric (GE) Terminet 120 line printer to operate with Data General Corp. (DG) or Digital Computer Controls (DCC) minicomputers.

Complete Package

The series 160 interface is supplied as a complete package including controller board, installation instructions and operational and diagnostic software.

The units are fully compatible with the minicomputer manufacturers' software, a Custom Systems spokesman said.

The interface is priced at $750. Custom Systems is located at Suite 170, 2415 Annapolis Lane, Minneapolis, Minn. 55441.

POS Terminal Based on Micro

EL SEGUNDO, Calif. – Revenue Control Sciences (RCS) has introduced a programmable point-of-sale (POS) terminal.

The Model 101 PT can be programmed to function as an electronic cash register or as a financial services, retail merchant or place-of-business terminal, RCS said.

Standard features include an 8-bit microcomputer, real-time clock, 4K bytes of random-access memory (RAM) and 15K bytes of programmable read-only memory (Prom) and read-only memory (ROM) capacity.

Other standard features include an asynchronous communications port, 300 bit/sec modem, 16-position alphanumeric display, 26-key digit/function keyboard, alphanumeric 40-column printer with form-feed logic, external keyboard interface, remote display interface, terminal configuration/address switch, key lock mode switch and power supply, RCS said.

Operator lead-through messages are provided through a 16-position alphanumeric display.

The keyboard/display module may be located up to 24 ft from the printer/CPU module, it added.

Optional equipment includes an electrically operated cash drawer, remote alphanumeric display, remote keyboard, magnetic stripe credit-card reader, Universal Product Code wand reader and a dual floppy disk and controller, according to RCS.

A POS software development system with dual floppy disks, CPU, 8K to 65K RAM and Prom programmer is also available, RCS said.

The standard Model 101 PT costs $2,880, RCS said from 137 Richmond St., Box 868, El Segundo, Calif. 90245.

The *Silent 700* ASR Data Terminal. It shares time with good company.

The twin-cassette *Silent 700** Model 733 ASR data terminal from Texas Instruments is supported by every leading U.S. timesharing service company, a few of which are indicated here.

What's more, it's a powerful alternative to conventional teletypewriters. It's quiet. It transmits and prints data at 30 characters per second. And it reduces connect time and user cost.

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User programs are stored on cassette locally, reducing the cost of disc file storage at the remote computer.

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For more information, contact your nearest TI office. Or write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or call 713/494-5115, extension 2124.

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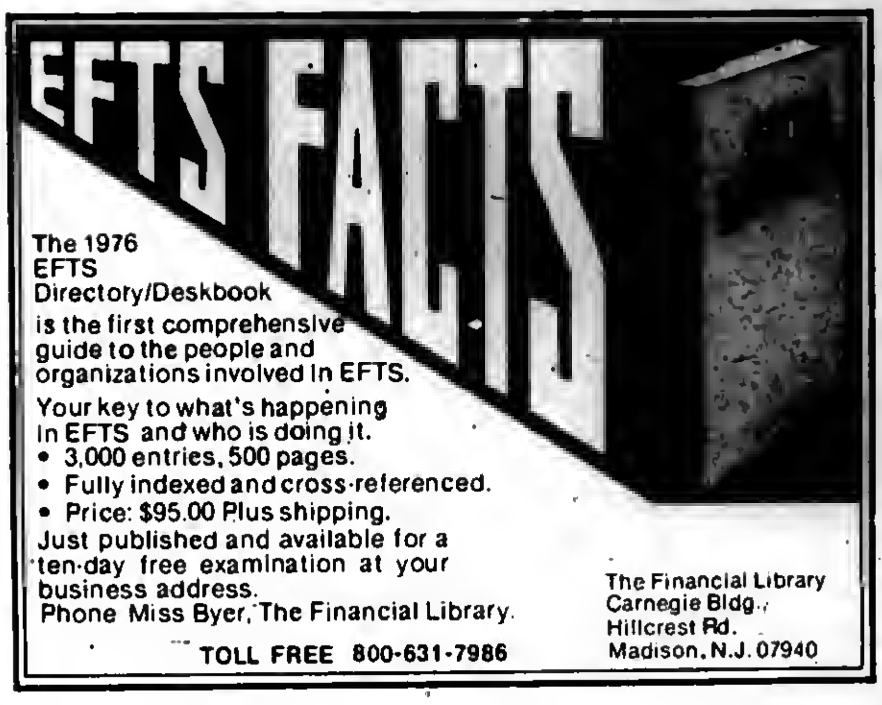
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Gamma Software Using Hasp Protocol Turns DG Nova Mini Into RJE Terminal

PALO ALTO, Calif. – Gamma Technology has introduced a program which is said to turn a Data General (DG) Nova minicomputer into a remote job entry (RJE) terminal using the advanced IBM Hasp workstation transmission protocol.

The program reportedly supports all the features of IBM's multileaving binary synchronous communications (BSC) workstations, including full compression of blanks and repeating characters in both transmitted and received data, transparent data transmission, character recognition code (CRC) checking, multiple I/O stream capabilities and operator console support.

The software supports transmission efficiency through the use of a technique which permits data to be transmitted with acknowledgement messages, Gamma said. The program also interfaces with DG's RTOS or RDOS monitors so that any peripheral supported by those operating systems can be utilized as an input or output device, it added.

Data from disk, magnetic tape or cassettes can be transmitted to a central IBM system, and output print and punch files can be stored on disk or tape for later processing, according to the company.

Under RDOS, the program can reside in either the foreground or background partition.

The minimum equipment required to run the program is a Nova with 12K words of memory and a real-time clock, operator console, 4074 synchronous adapter, an input device, an output device and a modem.

The one-time license fee for the program is $2,500, which includes binaries on magnetic tape, an instruction manual and one year's maintenance. Source code and card bootstrap decks are available, the company added from 800 Welch Road, Palo Alto, Calif. 94304.

Infotron Port Selector Can Serve Multiple CPUs

PENNSAUKEN, N.J. – Infotron Systems Corp. has added an automatic computer select (ACS) feature to its Timeline 450 computer port selector.

The ACS feature allows one port selector to serve multiple CPUs – the user makes the choice via his terminal keyboard, the company said.

The port selector is said to extend CPU terminal-handling capability by putting incoming lines in contention for whichever ports are available, rather than dedicating ports to lines which may not be in use. Any mix of local and distant lines are accommodated, Infotron said.

The 450 is also useful when the port limits of an existing front end have been reached – it will put up to 254 lines in contention for up to 124 ports, the company added.

With a port selector, all callers can use the same phone number, reducing telephone equipment costs, a spokesman said.

In a multiple CPU environment, the caller selects a CPU by hitting a key on his terminal and the Timeline 450 with ACS makes the connection, the company explained.

The port selector connects the incoming call to the first available port in the desired computer and passes the ABR character to the front end. The ABR feature recognizes transmission speeds of 110-, 134.5-, 150- and 300 bit/sec, Infotron added.

There are two standard 450 port selector base units, the TL450/1608 and TL450/3216. The capacity of either can be increased by using expansion nests, Infotron said.

The cost of the added features begins at $5,000, the spokesman said from 7300 N. Crescent Blvd., Pennsauken, N.J. 08110.

Compact Ann Arbor KSR, RO CRTs Feature Upper- and Lower-Case Set

ANN ARBOR, Mich. – Ann Arbor Terminals, Inc. has introduced what is said to be a compact CRT terminal in keyboard send/receive (KSR) and receive-only (RO) versions.

The K2050 KSR terminal and the R2050 RO terminal incorporate a 20-line by 50-character display format with an upper- and lower-case 96-character Ascii code set, the company said.

The K2050 has an RS-232 interface as standard equipment; 20- or 60mA current loop and total transistor logic (TTL) interfaces are optional.

Eight transmission rates from 110- to 9,600 bit/sec are also available as options on the KSR terminal.

The R2050 comes with a parallel TTL interface for transmission rates up to 1,200 char./sec as a standard feature, according to Ann Arbor.

Characters are written on a 7 by 9 dot matrix format in a 10 by 12 dot field on both units.

Command functions on the terminals include erase screen, line feed and carriage return. Cursor positions are right, left, up, down, home and X-Y positioning, it noted.

The R2050 and K2050 terminals cost $1,170 and $1,675 respectively, the firm said from 6107 Jackson Road, Ann Arbor, Mich. 48103.

Study to Detail European Tariffs

Special to Computerworld

LONDON – The problem of unraveling the complex tariff structures for European and Europe-U.S. telecommunications may soon be eased.

The rates for telephone, Telex, and data communications within and among the 17 major European countries and between these countries and the U.S. vary widely.

But now details of tariffs and services will be made available in one publication by Logica Ltd.

The company reportedly is surveying telecommunications services, and the first volume of the results is scheduled to appear in September. Cost to initial subscribers will be about $3,800.

The survey will be updated to reflect new developments and cost changes, the firm claimed.

Logica Ltd. is at 64 Newman St., London W1P 3PG, England.

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Hendrix OCR Page Reader Available for $11,500

MANCHESTER, N.H. – Hehdrix Electronics, Inc. has introduced an optical character recognition (OCR) page reader priced at $11,500 for data entry and word-processing applications.

The OCR-2 unit can be operated as a communications terminal, the firm said, or interfaced to existing remote data systems.

At present the unit has the capability to read OCR-A and OCR-B characters at a rate of 220 char./sec, the firm said.

Hendrix is at 645 Harvey Road, Manchester, N.H. 03103.

Booklet Discusses Security Pitfalls

NEW YORK – Bonded Services has published a free 12-page booklet which details the security limitations and other shortcomings of records storage facilities for the protection of vital records and data media.

Most on-site records storage facilities are designed primarily as repositories for frequently used records and DP media, not for the secure protection of irreplaceable information media, according to the "Information Security Primer."

While not disputing the security of bank vaults, the primer suggested vaults lack essential environmental controls for DP media, noting data withdrawals are time-consuming and records are usually inaccessible after banker's hours.

Commercial warehouses, the brochure added, may be a low-cost alternative for basic records storage, but often lack appropriate environmental controls, security safeguards and support services for data media.

The optimum protection facility should be off-site and managed by full-time information security professionals. It should also be protected against natural hazards such as fire and magnetic fields and provide essential support services, the primer stated.

The primer is available from Bonded Services, Department D2, 733 Third Ave., New York, N.Y. 10017.

Seventh Amdahl 470 Installed

CINCINNATI – The seventh Amdahl Corp. 470V/6 has been installed at the Southwestern Ohio Regional Computer Center, a service bureau here.

The system was operational 35 hours after it was delivered, the center said.

The 470V/6 performed 70% faster than the center's 370/168 in benchmark tests, the center's director claimed.

Survey of Users, Dealers Finds

Univac Nears HIS in Used Gear Policies

By Nancy French
Of the CW Staff

Univac's policies toward users of used equipment are only "somewhat less" restrictive than those of Honeywell Information Systems (HIS), a recent survey of users and used equipment dealers showed.

As a result, few users are willing to risk the difficulties that can arise in installing and operating used systems despite the money they could save, the survey found.

The harshest criticism leveled at Univac by those interviewed concerned precertification for maintenance.

One nser who bought two tape drives from a used equipment vendor complained that, after Univac inspection, $3,000 worth of labor and parts were put into the equipment to qualify it for a one-year maintenance agreement.

The drives had been warehoused for 20 days and, prior to removal from the first owner's site, had been under continuous Univac maintenance, he said.

Users who elect to do their own maintenance or contract for third-party service are not permitted to retain vital maintenance documentation when they obtain a used system, they said.

However, neither users nor vendors reported serious difficulties with operating systems, and the survey found no license fees assessed for their use.

Several vendors who do business nationwide said Univac's policies are "inconsistent" from region to region. They attributed the inconsistency to the fact that each regional service center is a separate profit center and must be concerned about the profit implications of its policies.

A Univac spokesman, however, denied any inconsistencies in policy, but admitted the company has "no formal policies" on some of the issues raised by those surveyed.

As for operating systems, however, the spokesman said "a system is a combination of hardware and software and it is fundamentally the responsibility of the manufacturer to supply this."

Since "an operating system is typically on a reel of tape," if a system is sold and an operating system goes with it, "it's there" for use by the next owner, he said.

In cases where a system is three or four years old, however, and the original owner sells it to someone else, the new owner would have to "come back to the original manufacturer for improvements issued since the original purchase.

"If this happens, then you have to pay for it," he said.

Few Upkeep Problems

Users who sign maintenance agreements with Univac seem to have few problems. For example, Don Groetzinger of Western Publishing in Racine, Wis., said Western "enjoys a fine levcl of service on all its equipment."

Western has bought equipment "wherever I can get the right price," he added.

Noting he did buy "quitc a bit of equipment from Univac" initially, Groetzinger praised Univac's maintenance and additional courtesy of inspecting used equipment before he had to commit himself to a purchase.

"Usually we have Univac make an inspection of any equipment before I make a firm offer. Charges are usually minimal, based on the time involved," he said.

"I bought a 9300 down in Tuscaloosa, Ala., for example, and [Univac] had to drive in from Huntsville to examine it, so naturally I paid the mileage charges and so forth – nothing different from what you would expect. [Univac] gives you a good shake," he said.

Bill Grinker of American Used computers said Univac reserves the right to inspect equipment before maintaining it and occasionally comes up with charges associated with recertification of equipment for maintenance agreements.

"Univac charges less than $30 per hour", compared with HIS' $95; parts are "expensive but not unreasonable," he said.

Can Lease Documentation

A Univac spokesman expanded on user experience, explaining users who don't wish to sign maintenance agreements with Univac may lease necessary documentation from Univac on an annual basis. Charges start as low as $100/year, depending on the type of system.

"This policy is not stated in the maintenance agreement because the user doesn't have control over documentation," he said, "but if someone comes and asks us for documentation, we will send him a contract with charges based on a fixed price list."

Users who are located far from a Univac maintenance base and are subject to a surcharge for field engineers' travel to the site take advantage of this offer, he said.

Depressed Prices

Since only the most experienced DP manager or onc who is actually spending his own money – the president of a service bureau, for examplc – wants to risk hassles with maintenance and spare parts, prices of used equipment are extremely depressed, one vendor said.

Univac's 9000 series equipment is selling for about 10% to 14% of its original cost, he observed.

But the low prices can work to the advantage of users who have in-house maintenance skills. Many buy used systems for spare parts, thus avoiding delivery time for spares when they are needed.

One vendor said Univac makes a distinction between its used RCA gear and the old Univac equipment. He said he has found the firm much more aggressive in enforcing ils policies on old RCA gear because; "I presume, it's trying to kill off the Series 70 line and encourage users to bridge over into the 9000 series."

Cummins-Allison Keyscan 3400 Handles Remote Processing Jobs

GLENVIEW, Ill. – The 3400 Keyscan system, a key-to-disk or multimedia system for remote processing operations, is available from Cummins-Allison Corp.

The 3400's memory can range from 48K to 130K bytes; 2.45M- to 9.8M bytes of disk storage are available, Cummins said.

The Keyscan supports two to eight CRT keystations, a magnetic ink character recognition (Micr) document reader/sorter, a card reader and 125- or 250 line/min printers, the company added.

IBM-compatible 2780, 3780 or 2968 communications packages are available, a spokesman said.

The system can perform data entry and front-end processing on-site and can communicate with a Cummins 4400 Keyscan system or mainframe, Cummins said.

"With the 3400 system, a company can install data entry systems in remote departments or branches for any general entry applications. All processing and report generation can be performed on-site prior to transmitting data to the host 4400 system or mainframe," Cummins claimed.

Two-Station Price

A two-station Keyscan with a 48K-byte processor and bisynchronous communications rents for $860/mo on a 24-month lease or can be purchased for $31,355.

A multimedia system with a reader/sorter and one CRT keystation with printer rents for $2,970/mo. The purchase price is $118,065.

Cummins-Allison is at 800 Waukegan Road, Glenview, Ill. 60025.

Why stick with a single source serial printer?

TALLY

System Designs Turbines to Tap Energy Resources

A computer is used to custom-design gas turbine systems used at oil and gas fields in some of the most rugged and isolated places on earth.

SAN DIEGO – Efficient, lightweight gas turbine systems that are designed by a computer and run on raw gas and crude oil are helping ease the task of tapping energy resources in remote oil and gas fields.

The turbine systems, manufactured by the Solar Division of International Harvester, headquartered here, drive compressors and pumps at such isolated and inhospitable spots as Alaska's North Slope, the North Sea, Siberia and the Mid-East deserts. Powered by the raw fuel they help extract, these simple and rugged turbines are replacing older, conventional engines that require refined fuel and greater maintenance.

To assure that turbine systems will deliver maximum efficiency at drilling locations, Solar uses an IBM 370/158 to aid in their design.

"Oil companies provide us with information on the tasks to be performed and the conditions they expect to face in the field," Robert E. Hattrup, manager of systems and data services at Solar, said.

"Pumping requirements vary according to temperature and altitude at the site, density of the crude oil, length and diameter of the pipeline, volume needs and other complex factors," he added.

The system is used to analyze the information and then help custom-design turbine systems by determining the combinations of pumps and compressors best suited for each particular installation, he said.

A turbine burns a compressed mixture of air and fuel to create hot gases, which spin rotor blades that turn the turbine's shaft. Gas turbines first were designed in ancient Greece more than 2,100 years ago, but were not perfected for industrial use until the mid-1960s.

"In addition to searching for new oil and gas deposits, many petroleum firms are returning to older fields which they abandoned years ago," Hattrup said. "When the oil and gas stopped flowing under its own pressure, the companies left the fields even though there were substantial amounts remaining.

"Now they're using our turbines to pump in gas or water to force the rest of the petroleum out, to help ease the energy crisis."

Solar has manufacturing and warehousing facilities throughout the world. The company's computer keeps track of both production models and spare parts, eliminating the chance of one facility falling behind in filling orders while another stockpiles inventory.

The system also schedules manufacturing of components and assemblies for the turbines.

VGI Releases Interactive 3-D Graphics Unit

WOODLAND HILLS, Calif. – Vector General, Inc. (VGI) has introduced what it said is its next generation of three-dimensional (3-D) interactive graphics display systems.

The 3400 is a direct-writing system capable of displaying 3-D graphics and alphanumerics with speeds up to 20,000 .1-in. vectors at 30 Hz, the company said.

The system employs a proprietary vector generator unit operating with buffer registers to minimize data access delay time and features a graphics processing unit (GPU) with microprocessor for fast data transformations, VGI said.

The standard 3400 GPU firmware includes perspective, windowing, clipping and zooming.

The GPU is microprogrammed with 47 user instructions, has a 4K-word control program, 16 general-purpose accumulators, 17 special address registers, a 247-word read-only memory (ROM) constant file and a 248-word random-access memory (RAM) data file, the company said.

The CPU is capable of circle/arc generation, 3-D transformation of all elements and cubic and rectangle synthesis, it added.

The 3400's refresh buffer unit has a capacity of 32K words of storage at a 16-bit word length and a 1-μsec access time.

The 3400 is usually front-ended with a minicomputer to accomplish data communications, he added.

The 3400 display is supported by the Vector Graphics Access Method (VGAM), a company-developed macro-oriented handler that is said to facilitate efficient graphics resource management.

VGAM was designed to ensure the operating integrity of each graphics task and the independence of each user station.

One 3400 display generator can support four CRTs and four sets of interactive devices, the spokesman said.

The purchase price for a typical configuration is $51,500 and includes the 3-D perspective, off-line high-speed digital transformation and display; 16-bit, 16K-bit-word refresh memory; font generator with ROM; 96-character Ascii set; a 21-in. display monitor and light pen; and one CRT workstation, the company said.

Deliveries are scheduled to begin in May, VGI said from 21300 Oxnard St., Woodland Hills, Calif. 91364.

Now you can make your software more reliable and less expensive in two hard days on Software Engineering.

The goal of this seminar on How to Increase Programming Productivity Through Software Engineering is simple: more cost effective and reliable software through improved analysis, design and implementation methods. We call it "Software Engineering", and it's a topic that has become more and more important as software costs escalate. Right now, for example, it is not all unusual for the cumulative cost of software development, maintenance and enhancement to match or even exceed the total investment in hardware over the course of a system's life.

How to Increase Programming Productivity Through Software Engineering wil give you the information you need to evaluate the new Software Engineering methods receiving widespread attention as they apply to your organization. This includes Structured Programming, Structured Analysis (TM), top-down design, implementation and testing, and new approaches to managing the development process. The seminar will also enable you to evaluate the effect these new methods will have on your operation and management style.

Attention will be focused on the high leverage areas, especially methods for improving the analysis and design process. A recent Department of Defense survey showed that 64% of software errors tend to be hidden ones, and do not surface until late in the development cycle. Over half the total errors remained hidden until acceptance testing or later. Of these hidden errors, 83% were in analysis and design. These statistics emphasize that Structured Programming alone is no substitute for the structured approach to the entire development process to be stressed in this seminar.

Who Should Attend

The course is designed for managers. It does not get involved in the technical detail you will find in the large number of courses designed for programmers on new methods. When you have completed both days of intensive instruction and question and answer sessions, you'll have what you need to start using the methods and tools which can significantly improve the reliability and cost effectiveness of your software while increasing user satisfaction. Especially important — you'll know how to avoid the pitfalls that have trapped the innovative but unwary manager.

John W. Brackett, PhD and Prof. Clement L. McGowan are the Seminar Leaders

John W. Brackett, PhD is a founder of SofTech and is a company Vice President responsible for the development and application of improved analysis and design methods. Dr. Brackett has been a consultant to several major computer manufacturers on new program development techniques for improving programming productivity. He has presented this seminar to many large industrial and government organizations, including ITT, MITRE, United Technology, the U.S. Navy and U.S. Air Force. Together with Dr. McGowan, he developed a new graduate-level course in Software Engineering at Brown University.

Clement L. McGowan, PhD is a consultant to SofTech, and is an Assistant Professor of Applied Mathematics at Brown University. Dr. McGowan co-authored the recently published book, *Top-Down Structured Programming Techniques*. He has been a consultant to the IBM Federal Systems Division responsible for the development of many of the new methods currently receiving widespread attention. He is an associate editor of the *Journal of Computer Languages* and is a member of the IEEE Computer Society, ACM and Sigma XI.

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The charge for the entire 2-day seminar, including continental breakfasts, luncheons and all course materials is $300. Additional registrants from the same company are charged only $250. This does not include hotel rooms, if necessary, but we have reserved space at seminar hotels for attendees who wish them.

To enroll, look over the schedule below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

How to Increase Programming Productivity Through Software Engineering is presented by The EDP Seminar Series in association with SofTech, Inc.

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Mini Bits

Mini/Midi Systems Focus Of May Decus Symposium

MAYNARD, Mass. – The Digital Equipment Computer Users Society (Decus) will sponsor a Mini/Midi Symposium May 25-28 at the Omni International Hotel in Atlanta.

Six parallel sessions on each of the four days will focus on 18-bit systems and graphics and biomedical applications, Decus said. Attention will be given to Mumps, RSX-11, RSTS, RT-11 and OS/8 operating systems.

Capt. Grace Hopper, head of the U.S. Navy Programming Languages Section, will be the keynote speaker, Decus noted from Maynard, Mass. 01754.

Controller Handles 3M Tape Drives

MINNEAPOLIS – The Series 220 controller for 3M cartridge tape drives is available for Data General Corp. (DG) and Digital Computer Controls (DCC) minis from Custom Systems, Inc.

The basic controller, which costs $1,250, can handle up to four 3M drives, the firm said, providing backup capability for disk-based minis.

The controller is available from the firm at 2415 Annapolis Lane, Suite 170, Minneapolis, Minn. 55441.

Graf/Pen Linked to HP Calculators

SOUTHPORT, Conn. – Science Accessories Corp. (SAC) has introduced interfaces to link its Graf/Pen with Hewlett-Packard (HP) programmable calculators.

The Graf/Pen is a sonic digitizer that converts graphic information into digital for processing, recording or transmission.

The pens are both hardware- and software-compatible with the calculators, the firm said.

The models 1491 and 1492 interfaces for the HP 9815 and 9825 calculators respectively cost $1,195 while the Model 1485 interface for the HP 9810, 9820 and 9830 costs $1,200 from the firm at Kings Highway West, Southport, Conn. 06490.

Monolithic Cuts Monostore Costs

ENGLEWOOD, Colo. – Monolithic Systems Corp. has reduced prices on its Monostore V memory system for Digital Equipment Corp. PDP-8A, -8E, -8F and -8M minis.

Single-quantity prices now are $438 for a 4K system and $695 for an 8K system.

Previously, the 4K board cost $560 and the 8K board $995, the company said from 14 Inverness Drive East, Englewood, Colo. 80110.

Advanced Planning Crucial

Vendor-Independent Distributed DP Seen

By Esther Surden
Of the CW Staff

BOSTON – Users are seeking a "vendor-independent" way of configuring distributed processing networks, Hal B. Becker of Honeywell Information Systems said here recently.

Requests for proposals often omit significant elements and are ambiguous, which can lead to network planning error, he told a group at Minisystems '76, a two-day, Honeywell-sponsored conference.

Users need a concrete way to determine a network and predict the performance of a particular configuration, he said.

"It is also time to get rid of the 'vanishing problem syndrome,'" Becker added. Network design sometimes takes up to 18 months to complete, and during that time the user's business requirements can change. A way to deal with this situation is needed, he said.

The three elements of a distributed processing network include the system's information-processing functions, network-processing functions and data base functions, Becker said.

Information processing is the manipulation of data to produce desired results; network processing is the movement of information between various nodes in the network; and data base functions store information in forms appropriate for the user, he explained.

Remarking that data base is often considered part of the information-processing function, Becker said that "if the distributed environment is going to happen, it will be more efficient to bring data base out of information processing and manage it at an equivalent level."

Any network is a combination of these three function sets, Becker said. The task is to select appropriate subsets of the function sets and integrate them into a system.

The physical function subset consists of hardware devices that perform the movement and storage of data and logical functions that control the flow of information through and between the physical functions, he noted.

Six Areas to Consider

The user requirement statement should consist of six basic areas, Becker said. Users should furnish the "topology" of the proposed network, telling what city, country or continent is involved.

In addition, some indication of the volume of data to be handled by the network – including a distribution profile that answers the question, "From a given point, what percentage of the characters go where in the network?" – is needed, he said.

A statement of information-processing requirements would also include the physical configuration of each computer and specific response-time requirements for the system to be effective.

The network's availability should also be considered, Becker said. If the network is to be available 24 hours/day, a great deal of redundancy must be built in, he said.

In the analysis and design of a system, it may be necessary to repeat the steps until a workable network is developed, Becker said.

This is an interactive process because it takes a combination of automated algorithms and manually derived decisions to come up with a workable solution, he added.

The first step is to take the requirement statement previously developed by the user and build a file in a random-access storage media, he said.

The users can then take the physical and logical design and come up with a candidate configuration. The configuration is then modeled until it reflects acceptable performance.

The fourth step involves the installation of the final configuration, running various programs against the files to produce equipment lists, identification of carrier facilities, etc.

The actual measured performance of the network is then compared with the predicted performance. After the entire network is implemented using this sequence, users can easily update the configuration to reflect desired changes that have taken place during the 18-month implementation time frame, Becker said.

Compuvote Micro-Based System Reckons Precinct-Level Votes, Transmits Tally to Central CPU

By Nancy French
Of the CW Staff

BEVERLY HILLS, Calif. – Compuvote Corp. has introduced a microprocessor-based on-line precinct election system that is said to combine the immediacy of instant vote tallying at the precinct level with the permanence of stylus-punched cards.

The results of many card-oriented voting systems must be transported from the precinct to a central DP installation for tallying, a company spokesman said. The Compuvote system stores voter choices in a microprocessor memory in each precinct; when the polls close, elections officials can send the results in binary code over voice-grade lines to the central computer where they are registered and added to tallies from other precincts, he said.

The punched cards can then be stored in locked boxes and retained as an audit trail in the event of a recount. Overvote protection is built into the software, the spokesman added.

A voter makes his choices by punching a card with a stylus provided in each booth. An electromechanical interface built into a conventional Computer Election System (CES) Votomatic punch card vote recorder captures the votes in a temporary buffer.

When the voter has completed his candidate selection, he presses a "vote complete" button and the votes are tallied into the permanent random-access memory (RAM) inside the control console on the precinct official's desk.

If the voter changes his mind midway through his voting or makes an error, he may request a new punch card ballot and revote, since his votes are being held in the system's temporary RAM, the spokesman said.

When the polls close, a summary tally is printed out in each precinct on a paper tape for local certification and posting.

Tallies can then be sent to a central computer via dial-up, voice-grade telephone lines.

The micro-based system employs an Intel 4004 CPU with 1.5K bytes of programmable read-only memory and 512 bytes of RAM. This system permits 256 voting positions, up to 4,000 voters and four Votomatic vote recorder-terminals at each precinct.

A built-in LSI crystal-controlled acoustic coupler drives a speaker cup that fits over a standard telephone handset for transmission in either Ascii or cryptographic code at 110- or 300 bit/sec rates, the vendor said.

The precinct drum printer operates at 162 line/min using standard accounting paper tape.

The system, which includes a control console, microcomputer, modified CES vote recorders, printer, modem and system power supply costs less than $3,000 per precinct," Compuvote said from Suite 310, 9171 Wilshire Blvd., Beverly Hills, Calif. 90210.

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Selecting a Mini — Part 4

Maintenance a Two-Part Consideration

By Robert E. Berkman

Special to Computerworld

Maintenance refers to the responsibility of the vendor to fix problems that may arise after a system is installed.

It can be viewed in two parts: hardware maintenance and software maintenance.

Hardware maintenance is generally supplied by the manufacturer. In cases where a systems supplier has put together a system made up of various manufacturers' components, either the system supplier or an independent maintenance organization will provide maintenance.

Hardware maintenance terms should be checked carefully. With an in-house system, downtime often severely impacts day-to-day business. One must therefore make sure the equipment can and will be fixed rapidly.

This is the fourth in a five-part series on the selection and evaluation of business minicomputer systems. Next week's article will cover some final considerations.

Maintenance should be provided from a nearby facility. In addition, the maintenance facility should have sufficient spare parts to alleviate the need to secure parts from a distant warehouse location.

An adequate staff should be located at this facility so response time on calls is kept to a minimum. Other users' experience should be checked in terms of responses to maintenance calls.

Another safety factor is the availability of a backup system to handle the processing in the event of extended outage.

Software Upkeep

Systems software maintenance generally will be provided by the hardware manufacturer. The software vendor will provide applications program maintenance.

Some turnkey vendors have modified a manufacturer's system software and therefore must provide system software maintenance themselves. Once the software has been modified, it should be considered new software, and therefore, the installations using the manufacturer's software do not represent the actual number of implemented systems.

Also, the number of of people knowledgeable in the system software should be considered. It is risky if only one or two people understand the software thoroughly.

Extra Dimension

If the user has selected the list of vendors carefully, he will probably come up with several that can do a good job of implementing the system he wants. With this in mind, an extra dimension must be added to his evaluation.

This extra dimension is risk analysis, made by hypothesizing situations that could develop in the user's relationship with the supplier.

One possibility is that the supplier will go out of business. Based on the events of recent months, it is evident this possibility exists even with large suppliers.

A significant number of hardware manufacturers, turnkey vendors and software companies have not been able to sustain themselves economically and have withdrawn from the marketplace. The financial credentials of all potential vendors should be checked carefully.

In some cases, even though the company has stayed in business, the client has found it is not to his best interest to continue his relationship with the supplier.

One must be protected from total breakdown of the DP facility if either of these events should take place.

If the equipment bought is from a manufacturer with a great number of installations, the risk of not being able to get maintenance is reduced.

First, there is a pretty good chance the installation base will be picked up by another manufacturer who will provide the maintenance.

Second, organizations specializing in computer maintenance could be a resource for the user. This will have an impact, however, on the ability to upgrade configuration to meet company growth. If the hardware is no longer manufactured, it may be difficult to get additional components at a later date.

When a configuration consists of various manufacturers' components, the maintenance problem is even greater. While the user probably will be able to get a maintenance organization to service him, the costs will be very high.

In addition, very few people within that organization will be well trained in all aspects of the hardware to be maintained.

The maintenance of system software and applications software must also be considered. If the manufacturer's standard system software is used, the user has a much better chance of securing maintenance than he will have with an operating system developed by an outside source.

If applications programs are written in a common language, maintenance should be no real problem.

The user will find significantly fewer people who can maintain a system in Assembly language.

New languages developed by system suppliers are generally only known well by the employees of that company and provide the greatest risk.

In any case, the user should make sure he is supplied with complete documentation.

Berkman is president of Robert E. Berkman Associates, a Ridgewood, N.J., consulting firm specializing in selection and installation of small business systems.

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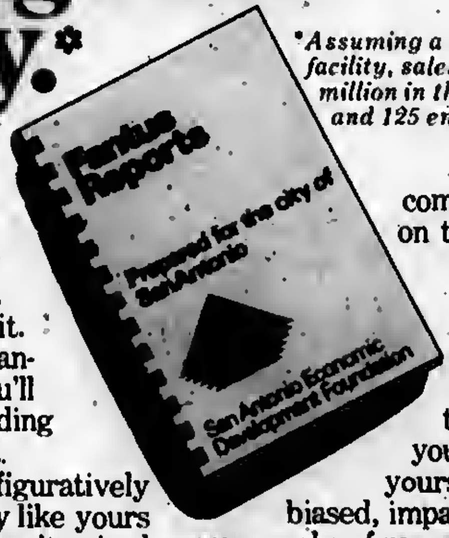
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Mini Simulates Gamut of Conditions to Test Engines

By Marvin Zalevsky
Special to Computerworld

PITTSBURGH, Pa. – With federal emissions requirements and the energy shortage, dynamometer testing of gasoline engines has become more sophisticated. With this sophistication has come the need for minicomputer control.

For many years the dynamometer has been the standard instrument used by automotive engineers to perform gasoline engine testing and analysis. Tests were usually conducted at full throttle and results were concerned mainly with maximum performance and durability.

Now, testing for environmental and fuel-consumption ratings requires the simulation of the whole gamut of driving conditions.

In addition, meaningful efforts toward improving emissions levels and fuel economy require that parameters such as air fuel ration, spark timing, exhaust gas recirculation (EGR) flow rate, speed and load be adjustable.

At Essex, a United Technologies subsidiary, which has dynamometer facilities at its Pittsburgh Division, the time-consuming manual operations involved were threatening to slow the production of valid data down to a trickle.

To cope with this, Essex constructed a minicomputer-managed dynamometer facility by adding some special engine-controlling hardware and a minicomputer to the basic dynamometer apparatus. The mini is a 32K Data General Corp. Nova 1220, and the program is written using multitasking Fortran and Assembly language.

The operator has a set of panel-mounted instruments including displays and controls for speed, load, air/fuel ratio, EGR percentage, mass air and fuel.

The air/fuel ratio for the engine may be held to a constant by an operator command. This means the operator may vary speed load, spark timing and EGR flow rate, and the system will adjust the fuel flow as required to maintain the given ratio.

Enhances Testing

With this equipment, much critical testing can be done which was not previously possible. An operator command has been added to open or close injectors to each cylinder, and timing and logic circuitry allows operation under sequentially timed or simultaneous fuel injection modes.

Data from the engine may also be averaged by the mini over a given time period to eliminate "spikes" which may occur. Temperature and pressure guages attached at critical places on the engine provide the computer, and in turn the operator, with more information on engine activity. Also monitored are emissions data and fuel consumption.

The information gathered is used to update the display devices on the operator panel and to give the computer feedback on engine conditions. When the operator has set the engine to the given experimental parameters, he issues the command to record the data, whereupon the system collects all the data it has, including readings on the operator control panel, and transmits this to a direct-connected Interdata 7/32 system where the results are stored for further analysis. It is not unusual for over 15,000 lines of data to be transmitted during a working day.

The results of this work include a large data base which may be used to examine the characteristics of the engine being tested. Hopefully, the data will indicate what happens to emissions and fuel consumption at varying air/fuel ratios, how spark timing can be used to decrease fuel consumption, etc..

Zalevsky is a senior programmer at Essex.

Guide Analyzes 40 Small Units

PENNSAUKEN, N.J. – The *Auerbach Guide to Small Business Computers*, intended for comparison shoppers, analyzes 40 small business systems in depth and gives specifications for over 230 systems, according to Auerbach Publishers, Inc.

Current pricing information, user reactions to each product and a checklist guide for the buyer are included. in the 275-page paperback book, Auerbach said.

Covered in the guide are such products as the BSL Northrup BDS series, General Automation DM 100 and DM 200, IBM 5100, System 32 and 3/12, Martin Wolfe Mesa Two and NCR 399.

A checklist designed to help the user during the evaluation and selection procedure covers the corporate background of the firm with which he is dealing, names of references and questions to ask references.

In addition, the list includes the hardware and software characteristics to be considered.

The guide is available for $29.95 from Auerbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

DON'T INVEST IN A CUSTOM-TAILORED BUSINESS COMPUTER SYSTEM WITHOUT CHECKING THE COST OF DASL.

Like it or not, a successful business computer system must be custom-tailored to the user's requirements. Until now, the initial cost of tailoring a system to your application has been high. All too often, changes or additions to a system have even been more expensive. And many systems just don't have the horsepower to keep pace with a growing business.

DASL is a new approach to business computers from Ball Computer Products. Whether you plan to write the applications programs yourself or turn the job over to a software house, DASL can produce an on-line system unique to your business needs in a fraction of the time required by COBOL, BASIC, or other conventional methods. And your total system costs will be less than half of a batch processing computer such as an IBM system 3.

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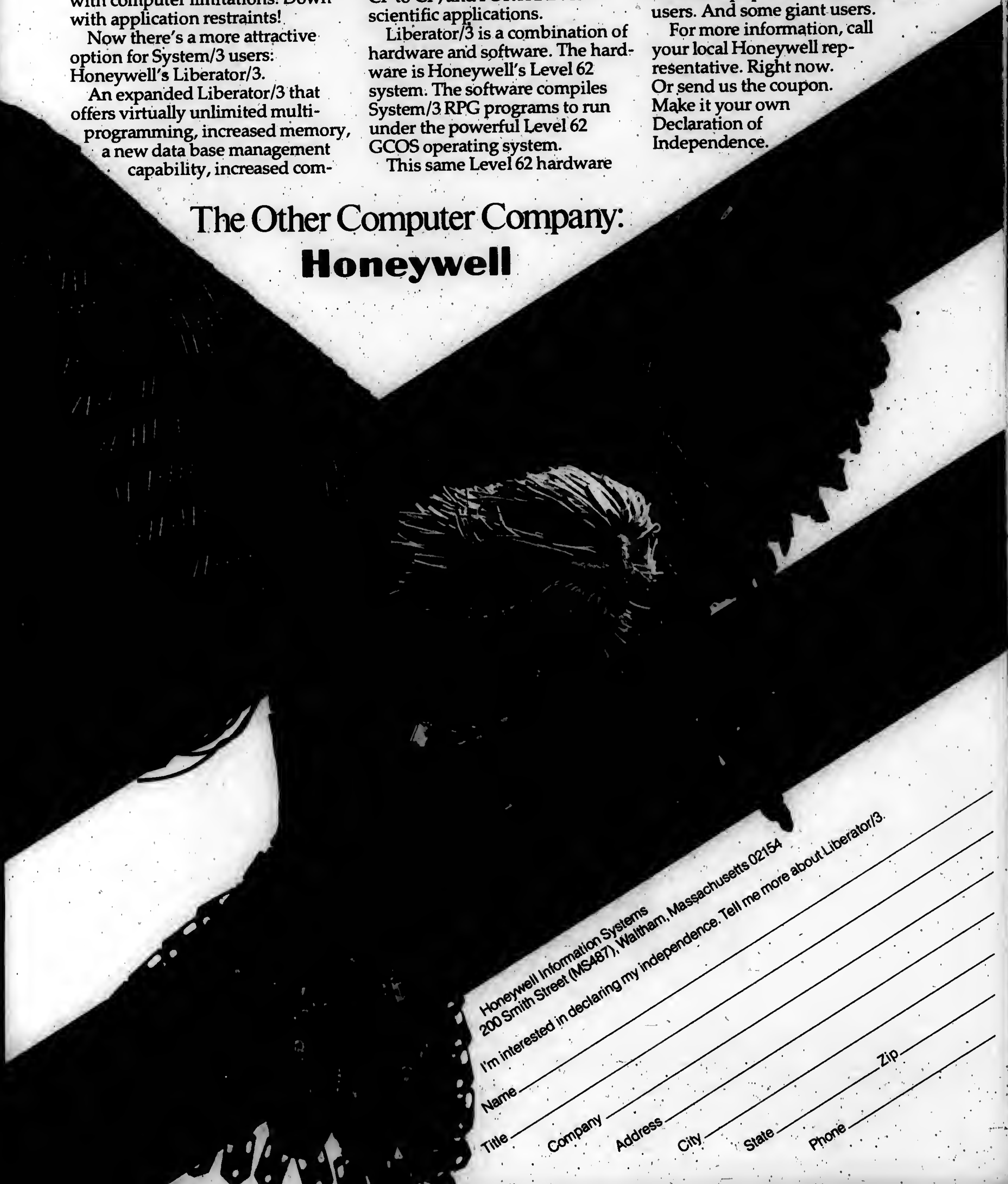

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Welke Notes User Attitudes

IBM Unbundling Cited as Software Industry Impetus

By Edith Holmes
Of the CW Staff

NEW YORK – Unbundling encouraged the growth of independent software companies by changing user thinking toward software, the president of International Computer Programs, Inc. (ICP) indicated in recent testimony before the court hearing the U.S. vs. IBM antitrust case here.

IBM's 1969 move to price hardware and services separately provided users with the "seal of approval" they needed to consider software written by independent vendors as an alternative source of programs, Larry Welke said.

Approval was necessary – even though IBM itself could not be called a major competitor in applications packages – because users were writing 90% of this software themselves, he said.

Various other factors also contributed to the growth of the software industry, he stated..

Welke implied, however, that the software marketplace grew more directly from the constant shortage of technicians in the field and the increasing importance of software to computing in general than it did from IBM's unbundling.

The marketing change helped users identify their software costs, he suggested, and recognize their ability to look for alternative sources of programs with a view toward decreasing DP expenses overall.

In addition, unbundling encouraged users "to consider software a product," he said. Welke was the first of the five government witnesses scheduled to testify on IBM's conduct in the area of separate pricing.

Bundling Retarded Efforts

Prior to the 1970s, bundling acted to retard independent software firms' efforts to sell software on that basis, Welke observed. Users didn't buy outside software during the 1960s in part because no one was seriously selling it, he said.

Bundled prices served to cloud users' perceptions of the costs of software and other services in the 1960s, Welke said. They were getting everything they needed for a single price; there seemed no need to look elsewhere, he remarked.

At the same time, users wrote nearly all of the applications programs and today remain the authors of 80% of it, the ICP executive added.

Computer systems manufacturers as a whole have never generated more than 10% of all available software; neither have they employed more than 10% of all programmers and systems analysts, according to Welke.

Specifically, "IBM has never been a major competitor in applications software," he said, adding separate pricing had little effect on that business.

However, the corporation is much more competitive in systems software because it relates directly to account control and IBM's ability to sell hardware, he suggested.

Welke said he couldn't see why IBM would be hurt by or concerned about the growth of independently supplied software except to the extent that more efficient outside software would suggest to users they could minimize the amount of IBM equipment in their shops.

The software industry has clearly grown in the years since unbundling, Welke testified. From $20 million to $25 million in 1969, revenues generated by independent software vendors alone jumped from $45 million in 1970 to $750 million in 1975.

Contract programming reached a high

(Continued on Page 37)

IBM Cites Payments, Sees Japan Threat

By Nancy French
Of the CW Staff

PHOENIX – Payments made in violation of IBM policies have totaled $53,000 over the years, but none were made to obtain business for IBM, Chairman Frank T. Cary told stockholders at the corporation's annual meeting here last week.

The payments were made in two countries, which Cary would not name. The largest payment was for $25,000; another for $6,000, was made to protect the safety of an IBM employee, he said.

On another topic, Cary remarked the firm faces tough competition in 1976, although recent products hold the promise of much new business. He cited particularly the Japanese government's efforts to bolster its DP industry.

"The Japanese government has joined forces with that country's DP industry to make DP products a major export industry," he said, calling this reminiscent of the way the Japanese expanded their automobile and ship-building industries.

Turning to prospects for the year, Cary said "a solid, steady" economic recovery already felt in the first quarter, combined with a "moderation of inflation," are the signs of another good year for IBM.

The order rate for DP equipment during the first quarter of 1976 increased "significantly" over the first quarter of 1975, he told the approximately 1,000 of the firm's 590,000 stockholders who attended.

Four Infractions

Detailing the payments, Cary said there were four infractions of IBM's policies and business conduct guidelines that prohibit bribes and political contributions "even in countries where they are legal."

Cary observed there were only four cases of violations despite IBM's roster of more than 290,000 employees in 127 countries.

In each case, disciplinary action was taken: two people were fired and one demoted, he said.

No Word on Court Costs

Cary dismissed the matter of antitrust suits in a few words and refused to tell stockholders how much IBM has spent defending itself against antitrust charges or to break down legal costs.

Such information would not serve the interests of the corporation or the stockholders, he said, and would help IBM's adversaries by revealing the level of importance IBM is placing on any individual suit.

The government's antitrust suit against IBM, which began in May 1975, is "moving ahead at a very slow pace," Cary said.

"Thus far, only witnesses for the government have been called," and it will probably be many more months before witnesses for IBM are heard.

"But nothing that has happened so far has dimmed my belief that our corporation is correct," he said.

In response to press questions, Cary said capital expendistures for 1976 are expected to be about $2.4 billion.

IBM also expects to be on the General Services Administration schedule for 1977, he said, noting that this year IBM has negotiated contracts with agencies individually.

Profits were down in the U.S. and up overseas, he acknowledged, adding this was to be expected since the world is so much larger than the U.S.

Explaining IBM's response to last year's depressed business activity, Cary told stockholders the firm had to consolidate manufacturing locations, reassign personnel and reduce new hiring to a minimum.

About 3,800 people received new assignments within the company and 1,700 people were moved.

Cary referred briefly to a number of systems in IBM's new product lineup, adding that still in the laboratory is a transistor memory with 5 million bits per square inch.

This memory will be "faster and use less power" than any other existing IBM product, he said.

(Continued on Page 38)

Completely Distributed Systems Won't Appear Soon: Spangle

By Molly Upton
Of the CW Staff

BOSTON – Completely distributed systems are still largely experimental, and their implementation will be evolutionary rather than revolutionary, according to Clancy Spangle, president of Honeywell Information Systems (HIS).

"Within the industry, in the next few years we can expect to see more standard distributed system product offerings. We can expect to hear more talk about this 'wave of the future.'

"But we must remember it will be five years or more before distributed systems become a substantial part of the data processing mainstream," Spangle told the Honeywell-sponsored Minisystems '76 conference here recently.

"There are many challenges yet to be met. Software for completely distributed systems, for example, is largely in the design stage.

"Manufacturers must develop common communications protocols that will provide the user more flexibility in designing a system. And the protocols must meet industrywide standards that do not yet exist so they are not too restrictive for users," he said.

Spangle said he wasn't trying to paint a pessimistic picture for distributed systems, but did want to be realistic.

One of the key elements determining the success of distributed systems will be their flexibility, he said.

If the distributed systems can be more flexible than the large centralized systems, this would be a large impetus for their growth, he said. But the concept that distributed systems are more easily modified than large systems needs more work, he cautioned.

He defined a completely distributed system as one with processing and information storage resident within the various operating components of an organization

(Continued on Page 36)

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Adopting Each Other's Characteristics

HIS Head Sees Mini, Mainframe Dividing Line Blurring

By Molly Upton
Of the CW Staff

BOSTON – With the expanding role of the minicomputer, it will be more difficult to distinguish between minis and mainframes because each will adopt some characteristics of the other.

But minis will not completely replace traditional mainframes, Clancy Spangle, president of Honeywell Information Systems (HIS), told the Honeywell-sponsored Minisystems '76 conference here recently.

Such replacement is "just not realistic when I consider the size of the installed base and user investment," he observed, adding, "I believe we'll see another generation of large systems."

In the future, general-purpose systems "will incorporate more of the technology that has tended to be used first in minis. That technology will either be directly integrated or used as building blocks of general-purpose systems – front-end, peripheral and communications processors and terminal controllers," Spangle said.

"At the same time," he added, "we expect that, as mini manufacturers get more into the end-user-oriented markets, they will act more like mainframe manufacturers.

"They will be expected to provide more support and services, either directly or indirectly through systems houses. Their marketing programs will have to be reoriented. Their businesses will necessarily become more complicated and involved as their need for financial and organizational resources grows.

"As some mini manufacturers have already discovered, this role is not an easy one to assume," he noted.

Price Erosion Smaller

Although Spangle said he sees price erosion in the OEM mini market, it will not be in the 15% to 20% range as in the recent past. Even if the processors and memory are cheaper, input/output is a major part of the system and that won't get as cheap as fast, he said.

The growth of minis is outpacing that of the mainframe area, but even so the mini base will account for 15% of the total by 1980, he said.

In 1976 the value of mini shipments is expected to increase about 35% over 1975 while the general-purpose market will be hard-pressed to achieve a 15% shipment value increase, he said.

"While the installed value of general-purpose computers is expected to increase at an annual rate of 11% to more than $90 billion by 1980, minicomputers will be growing at a strong 20% average annual rate.

"Their installed base will increase from about $5.4 billion in 1975 to nearly $15 billion in 1980," he said.

"While the greatest growth is occurring in the small and large areas, there is still a substantial market in medium systems," he said, observing HIS has booked its 400th double 64 system.

From 1975 to 1980, traditional mini applications will continue to form the bulk of the minicomputer shipments, "but their proportion will be decreasing," Spangle said.

"In the U.S. alone, we expect data monitoring and system control applications to account for close to $750 million, or nearly 40% of the mini shipments by the end of the decade. Last year they accounted for about $450 million, or about 50%," he said.

"Shipments for communications support applications are expected to stay around the 30% figure, but rising from 1975's $300 million to almost $600 million by 1979," he said.

"The remaining 30% of shipments is expected to go to the small business market, which will grow significantly as hardware costs decrease," he remarked.

"This market constituted about 20% of 1975 mini shipments, with a value of about $200 million. By 1979 its market share is expected to be valued in excess of $600 million."

At the low end of this market, the capabilities of minis will be enhanced by micros and micro-based computers.

"While there may be some displacement, micros will tend to be used for simple, dedicated tasks and minis will be required for more complex, general applications," he said.

Distributed Systems Evolutionary: Spangle

(Continued from Page 35)

and with each application program accessible by programs at other sites.

Some of the same arguments proposed for the use of centralized systems, such as economics and organization control, are now being advanced for the employment of distributed processing, he said.

Looking at telecommunications costs, Spangle said the trade-off between distributed and central systems will be influenced to a large degree by carrier prices and policies. Much systems work needs to be done to determine the trade-offs, he indicated.

Some Resistance

The resistance to change will stem more from users' organizational factors than technological considerations, he predicted. "It is inevitable that there will be some resistance by centralized organizations for a decentralized structure," he said.

"It will take time for users' organizations to select those languages, applications packages and data base capabilities that they will utilize.

"New designs will have to be implemented for overall monitoring and control of the entire distributed system. New organizational controls will have to be implemented," Spangle said.

"Many questions will have to be answered regarding such things as the expertise required to run the overall network and the costs involved in decentralizing programming and operating functions to the user departments," he said.

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Appeals Court Tells Experts to Appear at U.S. vs. IBM

By Edith Holmes
Of the CW Staff

NEW YORK – Two experts in the computer field who were unwilling to testify in the U.S. vs. IBM antitrust trial must appear in the district court hearing the case before the appellate court can act, according to a recent ruling from the U.S. Second Circuit Court of Appeals here.

The appeals court dismissed the request of Felix Kaufman and Frederick G. Withington to strike Judge David N. Edelstein's order that they testify [CW, March 22] on the grounds it does not yet have jurisdiction over the matter.

The appeals court also denied Kaufman's and Withington's request for a writ of mandamus.

The unwilling expert witnesses, called by the Justice Department and then subpoenaed, will risk contempt of court if they refuse to answer questions at the antitrust trial.

Kaufman, an accountant with 15 years experience in the computer industry, is employed by Coopers & Lybrand. Withington is an industry analyst with Arthur D. Little, Inc.

"The government is seeking the very core of my expertise, which I do not wish to provide and which I consider to be a proprietary asset available solely to my employer or to those for whom I wish to work," Withington told the appeals court.

In the majority opinion of the three-judge panel, Judge Henry J. Friendly wrote: "To clothe all such expert testimony with privilege solely on the basis that the expert owns his knowledge free of any testimonial easement would be to seal off too much evidence important to the just determination of disputes."

In a separate but concurring opinion, Judge Murray I. Gurfein advocated a case-by-case review of courts' ability to compel unwilling witnesses to testify "unless the federal rules of evidence can be amended adequately.

"A rule that experts may be called generally and required to attend might make the lives of some experts unbearable," he said.

The trip by Kaufman and Withington to the Second Circuit Court of Appeals came after Edelstein ordered them to make themselves available to testify.

Kaufman and Withington had asked Edelstein to rule that as experts they could not be compelled by a subpoena to appear in court in a case in which they have no interest, particularly when there are other experts in their fields who might just as easily be called.

The options open to Kaufman and Withington, if they choose not to answer questions at the trial, are to appeal directly to the Supreme Court, ask for a hearing by the full nine-judge panel of the Second Circuit Court of Appeals or go through contempt proceedings and appeal again to the Second Circuit's three-judge panel, according to observers.

Unbundling Seen Software Boost

(Continued from Page 35)

point in 1969, generating $600 million in revenues. This business then dropped to $400 million to $550 million in the early 1970s and came back up to $600 million in 1975," he said.

But rather than attribute this growth to increased competition in software following IBM's decision to price services and hardware separately, Welke indicated this industry's expansion was due to several factors, among them a shortage of good technicians and an increasing reliance on software instead of hardware to improve system performance.

Independent software firms, such as Planning Research Corp., Computer Usage Corp., Systems Development Corp. and Computer Sciences Corp. (CSC), were actually established in the late 1950s, he said.

Informatics and Applied Data Research (ADR) came later – around 1962, he recalled.

Reasons for Growth

Two main forces contributed to the growth of a dozen independent software vendors around 1960: the work these firms were doing for computer manufacturers, primarily on operating systems, and the continuing shortage of people qualified in DP, Welke said.

In the mid-1960s, the development of IBM's 360 system gave impetus to independent software company development by making the industry that much more complex in hardware and software and so increasing the demand for services, he told the court.

Welke estimated 30% to 35% of the systems software for third-generation machines was written by independent software firms. CSC did considerable work for Univac, for example, as did ADR for Honeywell, he said.

Around 1967-68, the software industry "exploded" in its growth, according to Welke. Then running the *ICP Quarterly* directory out of his dining room, he counted 2,800 firms engaged in some form of software development.

This expansion occurred because financing was "unbelievably easy" to obtain, Welke said. He repeatedly stated the software business has few risks associated with it.

In the late 1960s, Welke said, there were no appreciable expenditures related to starting a software company: "All you needed then – or now – is a coding pad and a sharp pencil."

During this period, top technical people were attracted to the independent software firms rather than to user shops or to computer manufacturers. The independents offered technical challenges, better pay and stock options, Welke stated.

The economic situation in 1970 weeded out the marginally competitive companies, he said.

Asked whether there would be more independent suppliers of software today if IBM had unbundled before 1969, Welke said there are too many factors involved to permit his speculation.

He noted the flexibility of the current marketplace and the fact that ICP listed some 800 software product suppliers and 200 contract programming firms in 1975.

Some say the market will quadruple in five years; others say four major software product suppliers will be left – not one of them IBM, he said.

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System/3 is a great computer. We make it better.

Payments by IBM Totaled $53,000, Stockholders Told

(Continued from Page 35)

Also still hatching is a computer language that would allow users to access a data bank using English instructions. The user will merely give an example of what type of information he wants without having to give precise instructions, he said.

The Satellite Business Systems venture will put the firm in head-to-head competition with AT&T, he said.

In response to a question from one stockholder, Cary acknowledged that customer approval of point-of-sale supermarket systems is "slower than we anticipated," but that the systems have great potential.

Stockholder Concerns

Stockholders who spoke up at the meeting were principally concerned about illegal political contributions, payoffs and doing business with South Africa.

The biggest brouhahs at the meeting arose between two rival church organizations. The Interfaith Center on Corporate Responsibility, represented by Timothy Smith, expressed concern over IBM's reluctance to cease doing business in South Africa.

In a resolution that would have ended IBM's activity in South Africa, Smith pointed out that AT&T and Polaroid have both agreed not to bid on systems supporting police and military functions.

"IBM has only one business criteria – profit," he said, noting that IBM has bid on the passbook system that keeps the apartheid system working.

Lester Kinsolving spoke in opposition to the resolution, which was defeated, asking the first group if its member churches turn away contributions from IBM employees.

The stockholders reelected to one-year terms the 20 members of the board of directors nominated in the proxy statement.

They also ratified the appointment of Price Waterhouse and Co. as IBM's auditor and approved two management proposals relating to employee stock purchases and an increase in the number of authorized shares of capital stock.

Two other stockholder proposals related to political contributions and outside counsel were defeated.

ims education

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CDC Head Cites Technotec

New Jobs Seen in Technology Exchange

PARIS – Massive numbers of jobs can be created through increased international cooperation in science and technology, according to William C. Norris, chairman and chief executive officer of Control Data Corp.

Solutions to the world's problems in energy, food, materials, education, health care and transportation could provide many new jobs, Norris told a news conference here recently.

"The answer lies in international cooperation to make better use of existing technology and be more efficient in developing new technology," he said.

CDC's worldwide computer-based service, Technotec, is helping to increase the exchange of technology, Norris claimed.

Technotec is a data base of technology described in a problem-oriented manner.

"Since Technotec was introduced eight months ago, over 50 organizations have either contributed technology descriptions to be stored in our computers or searched the data base or done both," he said.

'Best of Both Worlds'

Small companies have an important role in creating new jobs through technology exchange "because history shows small companies are better innovators than large companies," Norris said.

"However, we can have the best of both worlds with small and large companies working together with a work division best suited to each," he added.

Joint ventures are "probably the most appropriate approach" to long-term relationships between small and large organizations," Norris believes.

"A large company might have several hundred small independent companies associated with it, each of which is free to innovate in its own proven field and in its own individualistic way," he said.

CDC has begun a program to put all its technology suitable for exchange with others or for sale into Technotec and is encouraging other organizations to make use of it.

In addition to facilitating the transfer of existing technology, Technotec can assist in developing new technology more effectively by identifying opportunities for cooperation between different countries or between organizations within countries, he observed.

Seminar to Focus On Marketing

NEW YORK – A two-day seminar on "Marketing Strategies for Selling to the Telecommunications Industry" will be held May 17-18 at the Barbizon-Plaza Hotel here and will feature 18 speakers. The seminar is sponsored by Frost & Sullivan, Inc., in conjunction with Harry Newton, consultant, and Norm Brust, director of client services at Network Analysis Corp.

Topics include a look at the major telecommunications markets, an evaluation of monopolistic situations, the regulatory arena and selling to various segments within the industry.

Also, speakers will examine what the major suppliers such as IBM and AT&T are plannning and how independent suppliers fit in.

Videotapes of the sessions will be displayed at a conference in Los Angeles May 20-21.

The fee for the New York session is $375 and for Los Angeles $325 for the first attendee from a firm. Others receive a 20% discount.

For further information write Bob Sanzo at Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

Contract Negotiator Raises Retainer Fee

WINTER PARK, Fla. – International Computer Negotiations (ICN), a firm that assists computer users in negotiating contracts with mainframe vendors, has announced an increase in its annual retainer fee.

The retainer fee paid by clients is deductible from incentive fees ICN charges for producing unexpected savings.

Fees vary depending upon the computer manufacturer, type of equipment, structure of transaction and stage of negotiation when ICN is engaged, Joe Auer, ICN president, explained.

For a system valued at $500,000 to $1 million, ICN charges a minimum annual retainer of $3,500 for 30 hours.

ICN can be reached through P.O. Box 364, Winter Park, Fla. 32790.

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The Data Processing Department welcomes applications for a faculty position available September 7, 1976. A Bachelors degree required. Masters preferred. Three years business data processing experience is required. Rank and salary dependent upon qualifications. Requires strong interest in undergraduate instruction and ability to teach courses in the following areas: Systems Analysis, Programming Languages, Teleprocessing, and Data Base Management. Send complete resume to Professor Stuart J. Travis, Head, Data Processing Department, Ferris State College, Big Rapids, MI 49307

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Interested applicants should send a detailed resume, full salary information, and availability data to: Charles J. Lewis, Manager, Database Services

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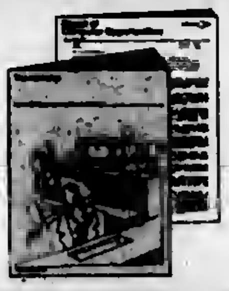

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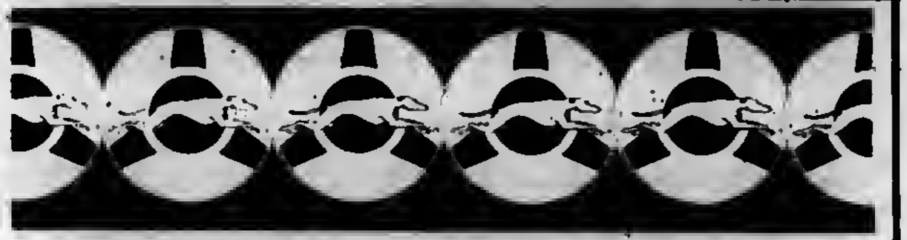

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Centronics Scores Record Periods

HUDSON, N.H. – Centronics Data Computer Corp. scored a record third quarter and nine months for both earnings and revenues.

For the quarter, earnings rose to over $2.9 million or 61 cents a share compared with over $1.9 million or 41 cents a share in the same period last year.

Revenues rose by more than 26% to $13.5 million compared with $10.7 million in the year-ago quarter.

For the nine months, Centronics earned nearly $7.8 million or $1.61 a share compared with nearly $5.6 million or $1.17 a share.

Revenues rose to $37.9 million compared with almost $31 million in the same period last year.

CA's Third Quarter Earnings Triple

IRVINE, Calif. – Computer Automation, Inc. (CA) reported third-quarter earnings tripled over those of a year ago while nine-month results more than doubled.

During the quarter, the firm earned $841,500 or 43 cents a share compared with $277,042 or 17 cents a share in the same period last year.

Revenues rose 49% to nearly $8 million compared with $5.4 million in the year-ago quarter.

For the nine months, earnings rose to $2.2 million or $1.14 a share compared with $792,943 or 48 cents a share in the same 1975 period.

Revenues grew to $22.3 million compared with $15.6 million in the same period last year.

President David H. Methvin attributed the quarter's record performance to a combination of factors, including the continuing economic upturn and the expansion of markets for the company's lines of low-priced minicomputers, as well as the automated production testing systems sold to manufacturers of printed circuit modules.

A new factor in the company's performance was the first revenue derived from a domestic customer for the Syfa System, the company's small business computer system.

The company believes that the customer, a large hospital organization, will use many of the Syfa systems throughout its network of hospitals, according to Methvin.

ADP Posts Improvements in Sales; Net Income Also Up in Three Months

CLIFTON, N.J. – Automatic Data Processing, Inc. (ADP) achieved record revenues and earnings in the third quarter,

Revenues rose to $49.2 million in the third quarter ended March 31, compared with $39.7 million last year.

Earnings were $4.6 million or 64 cents a share compared with $3.4 million or 48 cents a share last year.

Last year's results were restated for the acquisition of Cyphernetics Corp. on a pooling-of-interests transaction.

"Third-quarter results were better than planned, with the operations of all major segments of the company contributing to the strong performance," President Frank R. Lautenberg said.

"While the Financial Data Services Division benefited from record Wall Street trading volume during the quarter, and the Dealer Services Division was helped by the conversion of some minicomputer leases to outright sales, the quarter was adversely affected by losses in the non-DP subsidiaries," he said.

"In view of the year-to-date results and our expectations for the fourth quarter, we expect the improvement in earnings per share for fiscal 1976 to be in excess of 25%," Lautenberg said.

During the nine months, earnings rose to $12.5 million or $1.78 a share compared with $9.7 million or $1.39 a share in the same period last year.

Revenues climbed to $135.6 million compared with $112.5 million in the year-ago period.

Calcomp Shows Loss in Nine Months

ANAHEIM, Calif. – Although California Computer Products, Inc. (Calcomp) chalked up its second consecutive profitable quarter in the third period, the results were not enough to counterbalance a loss for the nine months.

For the quarter, the firm earned $356,000 or 11 cents a share compared with a loss of $4.6 million or $1.44 a share in the same period last year. Revenues rose to $30.7 million compared with $26.2 million.

During the nine months, the loss was diminished to $2.7 million or 82 cents a share compared with $3.6 million or $1.10 a share in the year-ago period.

Revenues dropped to $88.8 million compared with nearly $91 million in the same period last year.

President Lester L. Kilpatrick said, "The continued improvement in profits reflect cost reductions and increased productivity. Outlook for the fourth quarter is good. I expect the fourth quarter to show an increase in both revenues and profits."

Earnings Reports

APPLIED DATA RESEARCH
Year Ended Dec. 31

	1975	e1974
Shr Ernd	$.36	$.04
Revenue	12,732,765	10,529,792
Disc Op	b(131,840)	(197,010)
dSpec Cred	207,000	271,000
eSpec Item	.....	(411,000)
Earnings	431,736	49,281

e-Restated to reflect discontinued operations. b-Includes $17,949 gain on dispostion of time-sharing division. d-Primarily from a tax-loss carry-forward. e-Cumulative effect on prior years of accounting change.

ANALOG DEVICES
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.26	$.12
Revenue	8,566,000	7,229,000
Earnings	403,000	246,000

CAMBRIDGE MEMORIES
Three Months Ended Feb. 26

	1976	1975
Shr Ernd	$.03	$.03
Revenue	6,659,000	5,233,000
Earnings	54,000	46,000
6 Mo Shr	.....	.09
Revenue	11,577,000	10,903,000
Earnings	(604,000)	146,000

COMPUSCAN
Three Months Ended Feb. 29

	1976	1975
Shr Ernd	$.16	$.24
Revenue	3,474,000	2,756,000
Tax Cred	.....	151,000
Earnings	301,000	369,000
9 Mo Shr	.59	.59
Revenue	9,419,000	7,280,000
Tax Cred	251,000	371,000
Earnings	971,000	892,000

COMPU-SERV NETWORK
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.67	$1.23
Revenue	6,463,144	7,224,982
Tax Cred	.....	56,000
Earnings	354,510	652,708

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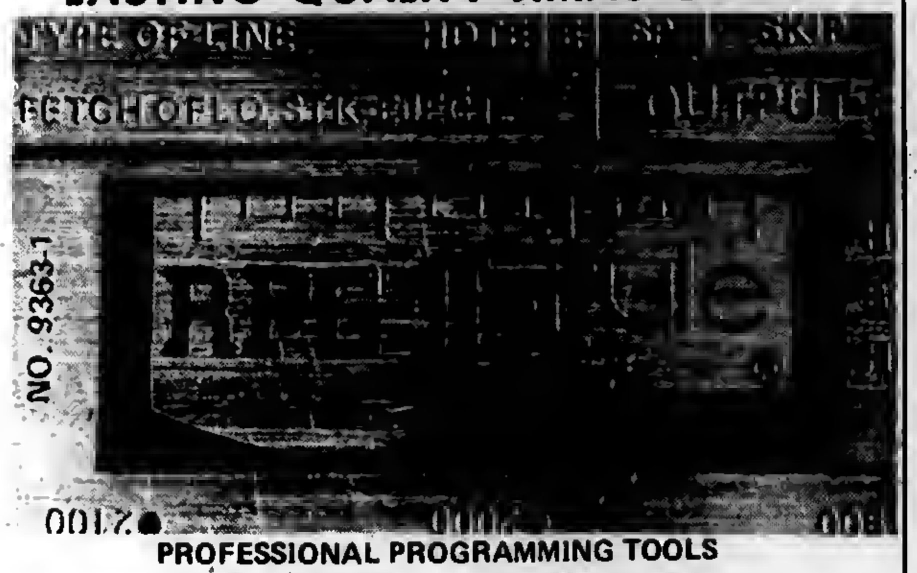

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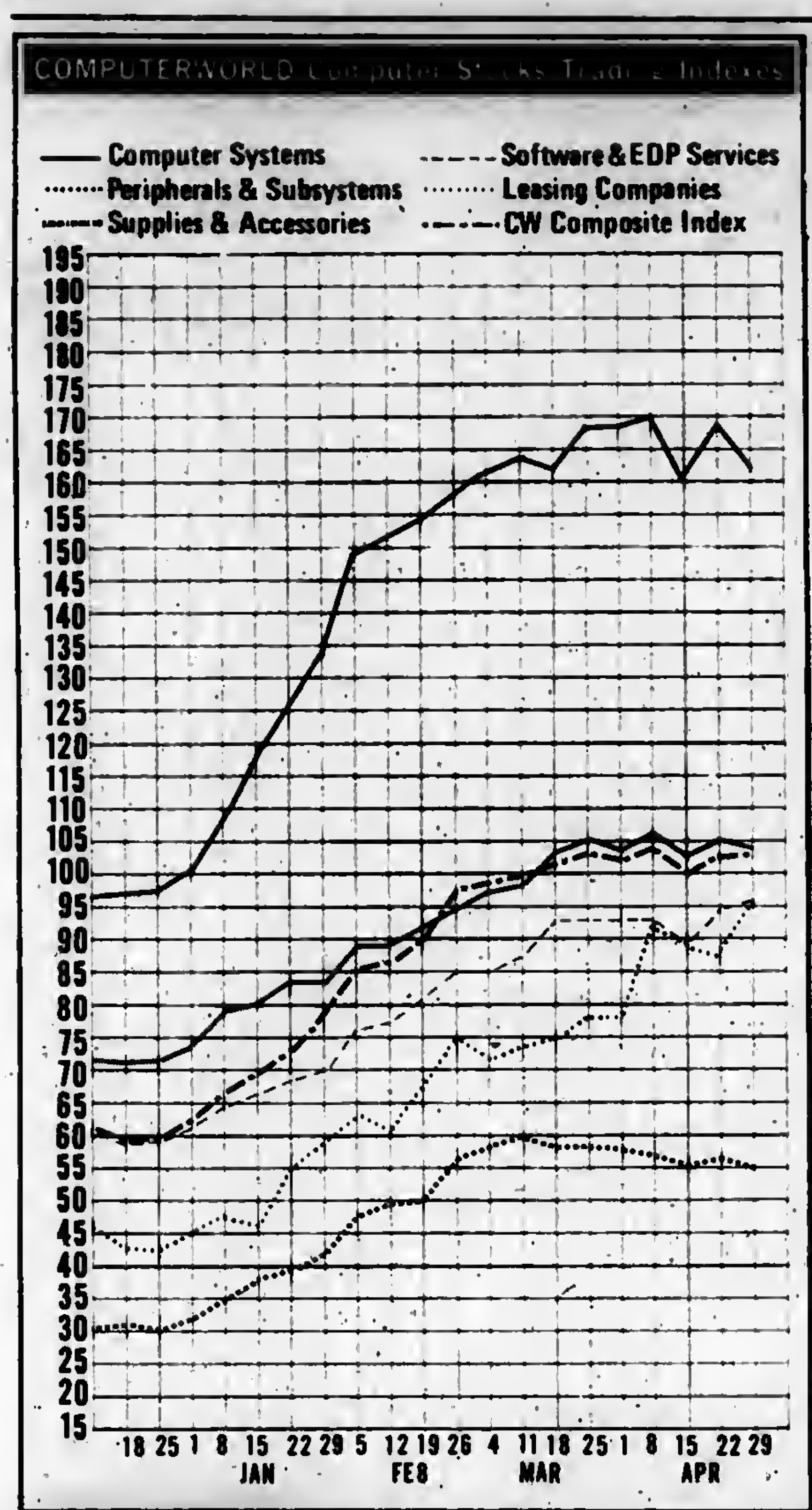

Earnings Reports

CODEX
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.28	$.73
Revenue	4,884,000	6,092,000
Earnings	444,000	1,077,000

COMPUDYNE
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.04	$.02
Revenue	9,520,105	10,134,962
Earnings	177,813	132,782

APPLIED DEVICES
Year Ended Oct. 31

	a1975	1974
Shr Ernd	$.42	$.31
Revenue	20,106,000	14,452,000
Tax Cred	775,000	580,000
Earnings	1,602,000	1,142,000

a-Includes results of Datatrol, Inc., acquired March 4, 1975.

COMPUTER PRODUCTS
Year Ended Dec. 26

	1975	1974
Shr Ernd	$.23	$.19
Revenue	4,451,223	4,018,481
Earnings	264,618	214,969

CONRAC
Year Ended Dec. 31

	1975	1974
Shr Ernd	$2.60	$2.32
Revenue	90,427,000	81,129,000
Earnings	3,503,000	3,093,000
3 Mo Shr	.78	.69
Revenue	25,698,000	20,621,000
Earnings	1,050,000	912,000

MACRODATA
Year Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.57
Revenue	$8,618,904	11,719,910
Earnings	(2,280,587)	955,861

MEDICAL COMPUTER SYSTEMS
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.56	$.43
Revenue	7,375,185	6,171,712
Tax Cred	701,700	559,334
Earnings	1,516,705	1,178,819
3 Mo Shr	.16	.10
Revenue	1,980,995	1,659,636
Tax Cred	190,700	137,334
Earnings	431,203	287,992

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 28, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE APR 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	105 3/8	-2 1/4	-2.0
O	COMPUTER AUTOMATION	2- 19	16 5/8	- 7/8	-5.0
N	CONTROL DATA CORP	11- 27	22 3/4	-1 7/8	-7.6
N	DATA GENERAL CORP	10- 60	57 1/2	-1 1/2	-2.5
O	DATAPOINT CORP	6- 41	40	+2 1/4	+5.9
O	DIGITAL COMP CONTROL	1- 4	3 3/8	+ 3/8	+12.5
N	DIGITAL EQUIPMENT	46-181	178 1/4	-3	-1.6
N	ELECTRONIC ASSOC.	2- 5	3 7/8	+ 1/8	+3.3
A	ELECTRONIC ENGINEER.	5- 16	14 7/8	-1	-6.2
N	FOXBORO	23- 42	37 1/4	+1 1/8	+3.1
O	GENERAL AUTOMATION	4- 14	10	-1 1/8	-10.1
C	GRI COMPUTER CORP	1- 1	1/2	- 1/4	-33.3
N	HEWLETT-PACKARD CO	58-120	110 3/4	-4 3/4	-4.1
N	HONEYWELL INC	22- 56	45 1/4	-1 7/8	-3.9
N	IBM	158-272	256	-4 1/2	-1.7
O	MANAGEMENT ASSIST	1- 3	2 1/8	- 3/8	-15.0
O	MEMOREX	1- 33	31	-1 1/4	-3.8
O	MICRODATA CORP	2- 26	21 3/4	-1 3/4	-7.4
O	MODULAR COMPUTER SYS	5- 19	9 1/2	- 1/4	-2.5
N	NCR	15- 39	26 3/8	-1 5/8	-5.8
O	PRIME COMPUTER INC	2- 11	9 1/2	- 1/4	-2.5
N	PERKIN-ELMER	16- 30	21 3/8	-3 5/8	-14.5
N	RAYTHEON CO	26- 59	52 1/2	- 1/2	-0.9
N	SPERRY RAND	26- 50	48	+ 1/8	+0.2
O	SYCOR INC	5- 31	27	-1	-3.5
A	SYSTEMS ENG. LABS	1- 10	8 7/8	0	0.0
N	VARIAN ASSOCIATES	7- 18	15	- 5/8	-4.0
A	WANG LABS.	7- 20	13 3/8	0	0.0

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE APR 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
C	COMDISCO INC	1- 10	8 1/2	+ 1/4	+3.0
A	COMMERCE GROUP CORP	2- 4	2 7/8	+ 3/8	+15.0
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	- 1/4	-12.5
P	DATRONIC RENTAL	0- 1	3/4	0	0.0
A	DCL INC	0- 1	3/4	+ [illegible]	+9.0
N	DPE INC	3- 7	6	0	0.0
C	EDP RESOURCES	1- 2	1	0	0.0
A	GREYHOUND COMPUTER	2- 7	7 1/4	+2 3/8	+48.7
N	ITEL	3- 13	11 7/8	- 3/4	-5.9
N	LEASCO CORP	4- 14	12 1/8	- 5/8	-4.9
O	LEASPAC CORP	0- 1	1/4	+ 1/8	+100.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	7/8	0	0.0
A	PIONEER TEX CORP	2- 9	7 3/8	+ 1/8	+1.7
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	11	- 1/8	-1.1

SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE APR 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	- 1/4	-15.3
A	APPLIED DATA RES.	1- 10	2 7/8	+ 1/8	+4.5
N	AUTOMATIC DATA PROC	29- 67	66 1/2	+1 7/8	+2.9
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
C	COLEMAN AMERICAN COS	4- 6	4 1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 7	6	-1	-14.2
O	COMP ELECTION SYSTMS	3- 8	8 1/4	+2	+32.0
C	COMPUTER HORIZONS	1- 1	1 3/4	0	0.0
O	COMPUTER NETWORK	1- 6	5 3/8	0	0.0
N	COMPUTER SCIENCES	2- 8	6 5/8	+ 1/8	+1.9
C	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 6	3 5/8	+ 1/8	+3.5
C	COMSHARE	2- 7	6 1/2	+2 1/4	+52.9
O	DATATAB	1- 2	1	+ 1/8	+14.2
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	12 1/2	- 7/8	-6.5
O	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	1 1/8	+ 1/8	+12.5
O	KEANE ASSOCIATES	2- 3	3 1/8	0	0.0
O	KEYDATA CORP	2- 5	2 7/8	0	0.0
O	LOGICON	3- 5	4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/2	0	0.0
A	NATIONAL CSS INC	6- 25	20 1/2	- 1/4	-1.2
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	20	+1	+5.2
N	PLANNING RESEARCH	2- 6	3 1/2	- 1/4	-6.6
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 5	3 1/8	- 1/4	-7.4
O	REYNOLDS & REYNOLD	10- 24	17 3/4	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
C	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	25 1/2	- 1/8	-0.4
A	URS SYSTEMS	2- 5	4	+ 1/4	+6.6
N	WYLY CORP	2- 7	4 3/4	- 1/4	-5.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE APR 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	9 3/8	- 5/8	-6.2
O	ADVANCED MEMORY SYS	1- 10	7 5/8	- 3/8	-4.6
N	AMPEX CORP	3- 8	7	- 1/2	-6.6
O	ANDERSON JACOBSON	1- 4	3 1/8	+ 1/8	+4.1
O	BEEHIVE MEDICAL ELEC	1- 6	5 1/4	+ 5/8	+13.5
A	BOLT,BERANEK & NEW	5- 13	7 3/4	- 1/8	-1.5
N	BUNKER-RAMO	4- 8	5 3/4	- 1/4	-4.1
A	CALCOMP	3- 7	4 1/2	- 5/8	-12.1
O	CAMBRIDGE MEMORIES	1- 6	4 3/8	0	0.0
N	CENTRONICS DATA COMP	7- 35	35 1/8	+2	+6.0
O	CODEX CORP	15- 42	33 1/2	-4 1/2	-11.8
O	COGNITRONICS	1- 2	1	- 1/8	-11.1
O	COMPUTER COMMUN.	1- 5	4 7/8	+ 3/8	+8.3
O	COMPUTER CONSOLES	3- 7	6	0	0.0
A	COMPUTER EQUIPMENT	1- 3	2	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	1 1/2	+ 1/4	+20.0
C	COMTEN	2- 9	7 3/4	- 1/8	-1.5
N	CONRAC CORP	12- 30	23 5/8	- 3/8	-1.5
O	DATA ACCESS SYSTEMS	1- 3	3	+ 3/4	+33.3
O	DATA 100	5- 16	10 5/8	- 1/4	-2.2
A	DATA PRODUCTS CORP	2- 11	10 3/8	- 1/8	-1.1
O	DATA TECHNOLOGY	1- 3	1 3/4	- 1/4	-12.5
O	DATUM INC	1- 2	1 3/4	- 3/8	-17.6
O	DECISION DATA COMPUT	2- 7	2	- 3/8	-15.7
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
C	DI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 3/4	0	0.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/4	0	0.0
N	HAZELTINE CORP	3- 12	8 3/4	- 7/8	-9.0
N	HARRIS CORP	18- 47	44 1/8	-1 1/8	-2.4
A	INCOTERM CORP	3- 20	14 3/8	- 3/4	-4.9
O	INFOREX INC	2- 7	5 3/8	- 1/4	-4.4
O	INFORMATION INTL INC	8- 18	14	- 1/4	-1.7
C	INTEL CORP	21-109	73	-2	-2.6
A	LUNDY ELECTRONICS	3- 7	4 7/8	+ 1/8	+2.6
O	MSI DATA CORP	3- 10	6 1/8	+ 1/8	+2.0
A	MILGO ELECTRONICS	8- 24	15 7/8	- 5/8	-3.7
N	MOHAWK DATA SCI	1- 7	5 3/8	- 1/4	-4.4
O	OPTICAL SCANNING	1- 3	1/2	+ 1/8	+33.3
O	PENRIL CORP	1- 2	2 1/2	0	0.0
A	PERTEC CORP	2- 8	6 1/4	- 1/4	-3.8
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	9- 10	9	0	0.0
O	QUANTOR CORP	2- 6	4 5/8	+ 5/8	+15.6
O	RECOGNITION EQUIP	2- 11	9 1/4	- 1/4	-2.6
N	SANDERS ASSOCIATES	3- 11	10 1/8	- 1/8	-1.2
O	SCAN DATA	1- 4	2 1/2	+ 1/8	+5.2
O	STORAGE TECHNOLOGY	6- 17	10 5/8	- 5/8	-5.5
O	T BAR INC	3- 10	6 3/8	+ 1/8	+2.0
O	TALLY CORP.	1- 6	4 3/4	0	0.0
O	TEC INC	1- 5	4 1/2	0	0.0
N	TEKTRONIX INC	18- 60	58 5/8	- 3/8	-0.6
N	TELEX	1- 5	3 5/8	0	0.0
C	WANGCO INC	4- 22	17 1/2	-2 3/4	-13.5
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE APR 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/2	0	0.0
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 10	8 3/8	- 1/8	-1.4
O	CYBERMATICS INC	0- 1	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	36 3/4	+ 3/8	+1.0
O	DUPLEX PRODUCTS INC	12- 25	18 3/8	- 5/8	-3.2
N	ENNIS BUS. FORMS	5- 8	6 5/8	- 1/8	-1.8
O	GRAHAM MAGNETICS	5- 13	11 1/4	- 1/2	-4.2
O	GRAPHIC CONTROLS	8- 21	18 1/4	+1 1/2	+8.9
N	3M COMPANY	43- 68	62 3/8	-1 1/8	-1.7
O	MOORE CORP LTD	39- 51	47 3/4	0	0.0
N	NASHUA CORP	9- 22	15 7/8	+ 5/8	+4.0
O	STANDARD REGISTER	11- 20	16 1/4	-1	-5.7
O	748 PRODUCTS CO	4- 8	7	0	0.0
N	UARCO	17- 25	24	- 1/2	-2.0
C	VANIER GRAPHICS CORP	4- 8	6 3/4	- 3/8	-5.2
A	WABASH MAGNETICS	3- 8	6 5/8	- 1/8	-1.8
N	WALLACE BUS FORMS	15- 25	22 1/4	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH.
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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NEWSPAPER

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.
/year May 10, 1976 Vol. X, No. 19

Court Stops FCC Interconnection Plan

Program Halted At Last Minute

By Ronald A. Frank
Of the CW Staff

RICHMOND, Va. – The Federal Communications Commission's (FCC) plan to initiate a registration/certification program for use of noncarrier equipment on the telephone network was halted at the last minute by a federal court order.

Scheduled to take effect May 1, the FCC program was "stayed and enjoined pending petitions for review" by Judge H.E. Widener Jr., U.S. circuit judge for the Fourth Circuit Court of Appeals here.

Citing the situation as an exceptional case, Widener said the two FCC orders approving the certification/registration program would mean "telephone subscribers throughout the country are going to have to pay for any costs."

If allowed to take effect, the rating structure of the telephone companies would have to be changed at a cost of "countless millions." The cost of changing the rating structure is irretrievable and must be paid by the subscribers, Widener said in his order.

"Anticipated future savings" which those favorable to the program had claimed would result are "speculative at best," the order said.

"Nothing before me indicated any consideration of the effect [of the program] on the ordinary subscriber's phone bill," Widener said.

Required DAA Plan Ended

The FCC-approved program would have replaced the currently required Bell Data Access Arrangement (DAA) by allowing noncarrier equipment to be directly connected to the dial-up phone network after

(Continued on Page 5)

Users' Options At Stake: Wiley

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T and other members of the telephone industry have launched a wide-ranging attack "to sweep away every last vestige" of recent Federal Communications Commission (FCC) policy, according to Richard E. Wiley, chairman of the commission.

Delivering the keynote address at the International Communications Association's (ICA) annual conference here last week, Wiley said the FCC has basically tried to "provide the American consumer with telecommunications options and alternatives" in two limited areas.

He defined these areas as customer-supplied terminal equipment and private line services.

In the terminal area, it is the FCC's conviction that "citizens should have the right to use their telephone system in a manner privately beneficial but not publicly detrimental"; in the private line area, "we believe consumers should be permitted to enjoy the communications options available from alternative sources," Wiley said.

Protecting Consumer's Options

"Protecting the American consumer's right to decide how his communications needs will best be met, and who can best meet them, undergirds the FCC's decisions permitting competition in these two well-defined markets," he told the conference.

As a result of FCC-fostered competition, the old monopolistic philosophy of "you can have it if we choose to offer it" has given way to a new responsiveness of the part of the established carriers, Wiley said.

The needs of consumers and small businessmen which previously might have been overlooked are therefore now pursued energetically by the telephone industry, he explained.

"I say all this not to denigrate the telephone industry, for which I have a profound respect and admiration," Wiley said, but competition has made AT&T and its partners "more vigorous public servants."

Commenting on claims that the interconnection of customer-supplied equipment and specialized carriers would harm the telephone network, Wiley said that "after nearly a decade of experience . . .

(Continued on Page 5)

In Latest Six-Month Period

Error Rate for SSI Checks Hits 23.7%

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Almost one-quarter of the computer-generated checks sent to recipients of the Social Security Administration's (SSA) newest federal welfare program in the last half of 1975 were wrong, the agency's Quality Assurance Program has determined.

The latest statistics for the SSA's two-year-old program for blind, aged and disabled adults showed a 23.7% error rate in payments made to a sample of the 4.3 million people covered under Supplemental Security Income (SSI).

With the study 99% complete, this error rate matched rather than improved upon the record of the SSI system in its earlier stages, despite expectations for improvement by the end of last year, according to SSA Commissioner James B. Cardwell.

Cardwell told the House Ways and Means Oversight Subcommittee chaired by Rep. Charles A. Vanik (D-Ohio) here recently that he and others in SSA anticipated an improvement in SSI's error rate because a computerized hookup to the regular Social Security benefits of clients, designed to check clients' real needs and reduce their benefits accordingly, became operational during this period.

SSI's interface with the rest of the benefits offered by SSA programs may actually account for an improvement in the error rate, but "there may be something that is offsetting it," Cardwell said before the committee currently investigating SSI.

Commissioner Puzzled

The commissioner indicated he was puzzled by the only "marginally lower" error rate. Some of the errors – up to 40% of them – were due to "client behavior" and will probably continue to be present in this national attempt, begun Jan. 1, 1974, to simplify and improve on state, county and city efforts to provide welfare for adults, he suggested.

The balance of the SSI errors could still be attributable to SSA's elaborate computer system, under study by various congressional committees – including Vanik's oversight committee and the House Government Operations Subcommittee, chaired by Rep. L.H. Fountain (D-N.C.), which commissioned the General Accounting Office (GAO) audit of the SSA's computer operations now in preliminary report form [CW, April 26].

Quality Assurance figures for July 1 to Dec. 31, 1975 showed the 23.7% error rate breaks down to 9.8% in SSI overpayments, 7.8% in ineligible payments and 6.1% in underpayments to recipients.

The overall error rate for the last six months of 1974 was 24.8%; for the first six months of 1975, it was 24.4%, according to the SSA program's numbers.

Cardwell and other agency heads expected that figure to drop to 19% or less once the computerized records of people who receive regular Social Security benefits were linked to SSI records. Because of eleventh-hour changes in the SSI program by Congress and management problems in SSA, the Bureau of Supplemental Security Income and the Bureau of Data Processing, both within the SSA, were

(Continued on Page 4)

NCC '76 Innovating With Eight Seminars On DP Development

NEW YORK – Eight full-day seminars on professional development will be presented for the first time at the National Computer Conference (NCC), scheduled for June 7-10 here.

The seminars will stress cost-effective computer usage and increasing professional skills, according to the American Federation for Information Processing Societies (Afips), NCC's sponsor.

On June 8, "Structured Programming in Cobol" and "Computer Networks" will be presented. The seminar on structured programming will be conducted by Robert G. Abbott, a staff consultant to Yourdon, Inc. and will be concerned with top-down design/implementation and "GOTO-less" programming. Included in the seminar will be a survey of program-

(Continued on Page 2)

Lack of Rapport Seen Impeding DP Progress in Social Services

By Catherine Arnst
Of the CW Staff

CHICAGO – The typical DP staff doesn't have an understanding of the social services staff – and vice versa – which has slowed the process of bringing technological change to the social services area, according to E. Bentley Lipscomb, deputy commissioner of the South Carolina Department of Social Services.

The managers in social services are "social work professionals who moved up through the ranks and had little contact with automated techniques; they tend to be individual case-oriented and are unfamiliar with computer technology," he said at the Human Services Information Systems Conference here recently.

Giving himself as proof of Lipscomb's statement, Earl Beatt, executive director of the Minneapolis Family and Children Services, said: "Frankly, I'm intimidated by a systems person. I came up through the ranks."

Currently, many managers are not good at articulating their needs to their DP staff; they often get data and results that they don't need and that lacks necessary information, Lipscomb said.

What is needed by social services agencies is a "broker" between social services-oriented personnel and the DP staff – "someone in the middle who can act as a linkage agent between the two entities so they can meet further down the road," he said.

The biggest issue facing the social services manager today is "accountability," Libscomb said. "He must be willing to develop a system that will provide accountability and he must work more closely with the DP staff to develop one."

Too often the social services agency uses a method where "planning follows action," Beatt said. This method won't work now when the theme of a social services agency is that "services must follow the budget," he continued.

"There is a danger of overuse of data processing for technical excellence," Beatt warned.

"Readily retrievable information can lead to overrecording for nonuses. We collect lots of data, store it, but don't use it," he said.

Some questions a social services man-

(Continued on Page 4)

Coverage of the **Human Services Information Systems Conference** continues on **Pages 6** and **7**.

COMPUTERWORLD
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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to Walter Boyd.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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NCC Sets Eight Development Seminars

(Continued from Page 1)

mer productivity techniques.

Marshall D. Abrams of the National Bureau of Standards will present "Computer Networks." It is intended to provide better understanding of the utilization and management of contemporary computer networks.

Three seminars will be presented on June 9: "Design of On-Line Systems," "Management Auditing of Computer Operations" and "Micrographics and DP."

"Design of On-Line Systems" will be conducted by Walter E. Simonson, associate director for DP at the U.S. Bureau of the Census, and will focus on types of on-line systems, the on-line environment, software, files and data bases and error-recovery considerations.

The seminar on management auditing will be headed by Harold J. Podell, an audit manager with the U.S. General Accounting Office. The session will emphasize recognizing the symptoms which indicate potentially costly problems and the impact of the computer on the entire operation of the organization.

Looking Ahead To NCC

"Micrographics and DP" will present a survey of microfilm technology, micrographic applications and expectations for the future. It will be lead by Terrence Koyle and John Mitchell, marketing specialists for Eastman Kodak Co.

"Structured Design," "Management of Software Engineering" and "Computer Applications for Learning Technology" will be presented on June 10.

'Peopleware' Problems

Edward Yourdon, chairman of Yourdon, Inc., will provide a briefing on program design and system design, including an examination of the program development process, in "Structured Design."

The session on software engineering will analyze "peopleware" problems and the future of software engineering along with the present objectives. The seminar leaders will be Walter Simonson and Paul Oyer, president-elect of the Federal ADP Users Group.

An overview of instruction systems development will be presented in "Computer Applications for Learning Technology," which will be aimed at application system designers, marketing personnel and engineers. Raymond G. Fox of the IBM Federal Systems Division will conduct this seminar.

Registration for the seminars is available only to those who preregister either for the entire '76 NCC or at least one day of the regular conference program. Attendance at each will be limited to 100 persons.

The separate registration fee for each seminar is $50, which includes complete course material and reference information. Further information can be obtained from Afips at 210 Summit Ave., Montvale, N.J. 07645.

Non-DPers in Small Businesses Getting Own Day at Conference

NEW YORK – The National Computer Conference (NCC) is branching out in a new direction this year with a full-day seminar on DP for nontechnical managers of small businesses on June 8. NCC will be held here June 7-10.

"This seminar is intended for the management of small organizations of less than 40 employees who are currently using manual methods. It assumes no specific technical DP background on the part of participants," according to the American Federation of Information Processing Societies (Afips), NCC's sponsor.

The seminar will be conducted by Verna Danner of Computer Learning Center. It will include a survey of available equipment and services, specific applications examples, considerations of the effects of DP equipment and services on existing personnel, an assessment of new skills required and the retraining of personnel plus an analysis of possible problems and pitfalls.

There will also be a special guided tour of the exhibits with emphasis on the applications covered within the seminar.

The registration fee for this seminar is $75, which includes complete course material plus access to all four days of the NCC exhibit program.

Further information can be obtained from Afips at 210 Summit Ave., Montvale, N.J. 07645.

Registration Deadline at Hand

NEW YORK – The deadline for advance registration for the 1976 National Computer Conference (NCC) is May 14. The conference, sponsored by the American Federation of Information Processing Societies (Afips), will be held here June 7-10.

Attendees who register in advance for the full conference will receive an NCC Bicentennial Card which will provide access to all four days of the program, including exhibits, at a savings of $15 over the on-site, full-conference registration fee.

Advance registrants will also receive a copy of the conference proceedings and the opportunity to attend eight professional development seminars available only to advance program registrants. Ten dollars of the registration fee may also be applied to first-time membership in any of the 15 Afips constituent societies.

Advance registration costs $60. Preregistration for one day of the conference programs and exhibits is $25; for all four days on an exhibits-only basis the price is $25; one day of the exhibit program is $10. The postconference price of a copy of the proceedings is $50.

For further information contact Afips at 210 Summit Ave., Montvale, N.J. 07645.

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Errors Found in 23.7% of DP-Generated SSI Checks

(Continued from Page 1)

unable to connect the files for these separate payment systems until early last summer.

The agency has also recently discovered several SSI clients have undisclosed bank accounts that can make them ineligible for supplemental Income, he said.

This may be primarily a "training problem," he added, which can be solved by teaching agency caseworkers to ask the right questions during initial interviews to determine client eligibility.

Vanik pressed Cardwell about numerous studies of the SSA's computer operations conducted since 1971, focusing particularly on the recently completed but as yet unannounced GAO audit.

That report indicates SSA computer utilization is only 50%, the congressman said; a committee staff observer later stated Vanik was being generous.

Expects GAO Revision

Cardwell, who has stated the computer operation at SSA is in need of a complete overhaul to the tune of some $500 million, told the committee he takes issue with the GAO audit report – a "very quick analysis" disputed by other computer experts.

The GAO may be revising its estimate that the SSA uses only 40% of the capacity of its 17 large-scale computers, he said.

SSA needs new computer technology and facilities because in a few years the 34 million checks it now processes each month will reach 50 million, Cardwell stated.

The commissioner characterized the SSA's computer operation as "a patchwork" put together over the last 10 to 15 years under congressional mandates to meet the needs of increasing numbers of welfare programs.

While "it may be that we put some patches where they were not necessary," Cardwell said he feared the risks of "a breakdown of service" without the proposed expenditures for the computer operation.

With the new technology, which the agency estimates would be installed over a period of five years, SSA might "leapfrog" to a system that bypasses "both check writing and the post office," Cardwell said.

But while he contended "we're just passing too much paper around," Cardwell suggested welfare recipients are often wary of banks and so might react negatively to an electronic funds transfer system. He thought any such system should first be tested on federal employees.

Rapport Lack Slowing Progress

(Continued from Page 1)

ager should ask are "why the data is needed, what data is needed for what purposes, how quickly is it needed and why is it needed that quickly," Beatt said.

Flexibility must be allowed for workers in the field and automation can permit this flexibility, "but systems and social services people are often at odds over this," he claimed.

The systems man believes that he doesn't have to know the nuances of social services practice to design a system, Beatt said. "Perhaps he doesn't, but he must be responsive to those nuances," he added.

However, people in social services often "use the old saw that 'our profession is an art, and a system won't pick up the nuances of the art. We may actually just not want to face up to our own incompetence," he said.

One of the easier methods to obtain a systems person who is responsive to the needs of the field worker is to turn the field worker into a DPer, Beatt suggested. "It's much easier to teach social services people systems than the other way around," he said.

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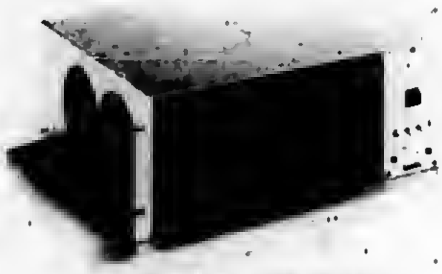

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Telephone Industry Legislation Threatens User Options: Wiley

(Continued from Page 1)

the telephone industry has yet to document any deterioration of the nationwide switched network."

In addition, Bell and the independent phone companies have not proven any adverse economic impact either, he said.

AT&T's increase in revenues for private line and terminal equipment services in 1975, compared with 1974, was more than double the total revenues of all competing suppliers of these services, he noted.

The specialized common carriers account for only .1% of their market, and the terminal equipment vendors have only .4% of their market area, Wiley said.

The combined revenues of both groups "do not exceed $170 million," while telephone industry revenues for the established carriers in this area are "over $4 billion," he said.

The specialized carriers have innovated in providing new services to users; it was a specialized carrier that provided the first switched digital data service, Wiley noted.

No Economic Losses

Despite claims from the telephone industry, "there is no basis for any intelligent conclusions as to potential economic harm" from competition, Wiley said.

Even if there were some impact, the phone industry seems to suggest "the only solution is to submerge or destroy the competitors."

This is an approach similar to contending that amputation is the only cure for a hangnail, Wiley told ICA attendees.

If economic harm should be proven, there are "numerous other alternatives," the FCC official suggested.

"First and foremost is the repricing and unbundling of telephone service rates to make them more competitive with independent suppliers.

"Second, the telephone companies might be authorized to impose access charges for terminals interconnected with the network.

"Third, specialized common carriers could be brought into the [intercarrier] separation arrangements.

"Fourth, usage-sensitive pricing could be adopted by state [regulatory] jurisdictions to allow users to pay only for the services they use and in relation to the costs they cause.

"And fifth, state jurisdictions could adopt a "lifeline service . . . which guarantees each citizen . . . an inexpensive phone," Wiley said.

AT&T Bills 'Serious, Persuasive'

WASHINGTON, D.C. – The efforts by AT&T to introduce legislation which would overturn competition fostered by the Federal Communications Commission (FCC) are both "serious and persuasive," according to Walter Hinchman, chief of the FCC's Common Carrier Bureau.

There is "some immediate possibility" AT&T will be successful with its congressional legislative effort, but these chances decrease as time passes, Hinchman told the annual conference of the International Communications Association (ICA) held here last week.

As legislators become familiar with the facts relating to competition from the specialized carriers and the interconnection of non-carrier terminal equipment, they will no longer favor passage of the Bell Consumer Communications Reform Act, he implied.

Users should write to the FCC outlining the benefits they have experienced from competition since "that side of the issue never gets explored very well," he said.

"We believe the public has benefited and will benefit, both tangibly and intangibly, from the stimulus of competition," Hinchman said.

"I am not aware of any instance where competition has played a role in [recent phone company tariff] increases. Instead, these increases appear to have been justified on the basis of inflation, wage settlements, increased demand and all the other factors which normally enter into such requests," he said.

Appeals Court Stops Interconnection Plan

(Continued from Page 1)

it had been certified technically safe by engineering tests.

After being certified as providing protection equivalent to that in the DAA, the equipment would have been registered by the FCC for direct connection.

Two FCC decisions created the certification/registration program after AT&T's claim of technical harm to the network from interconnection was shown to be unfounded.

These decisions were handed down by the FCC in October and March; attempts by AT&T and other telephone industry companies to challenge them met with rejection by the commission.

Capitol regulatory experts consider the stay order somewhat unusual because it was not signed by more than one appeals court judge.

These sources indicated officials at both the FCC and the Justice Department are studying Widener's order, leading to the possibility further petitions against the stay order could result.

AT&T issued a statement which said it was pleased with the order delaying the FCC program because serious related problems still have to be considered and resolved.

Several suppliers of noncarrier modems and other equipment had already taken steps to modify their equipment in anticipation of the certification/registration program's May 1 starting date.

The Independent Data Communications Manufacturers Association (IDCMA) is reportedly studying the appeals court order and considering further action.

Correction

The Burroughs Corp. B80's MOS main memory has a 1 μsec cycle time, not a 1 μsec access time [CW, May 3].

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DP in Human Services

Question of Priorities Arises

Privacy Protection Seen Backfiring on Individuals

By Catherine Arnst
Of the CW Staff

CHICAGO – Should the most important concern of privacy legislation be the individual's right or the public good? This question was posed by two speakers at the Human Services Information Systems Conference held here last week.

Although the Privacy Act of 1974 was meant to protect civil rights, that protection can backfire on Welfare recipients, the speakers said.

Applying the provisions of the Privacy Act to public welfare can be a "double-edged sword," James Trainor, director of state systems management at the Department of Health, Education and Welfare (HEW) quoted a former HEW Secretary as saying.

The present HEW Secretary, David Mathews, once said: "there are good sound reasons for collecting many types of information. Without adequate records, older Americans would not receive their Social Security checks.

"But the potential for careless or mischievous use of private information is a fact of modern life that we ignore at peril to our liberties as a free people."

The public welfare system "depends on an exchange of data between agencies to do a good job. When we deal with clients requesting services, we ask them to lay their souls bare," Charles McDermott, comptroller of the Oklahoma Department of Institutions, Social and Rehabilitative Services, said.

The situation has improved, however, McDermott said. An example of a less subtle time was 14 years ago, when Congress employed "night riders" to obtain information on welfare households in Washington, D.C., by visiting them in the middle of the night, he said.

Welfare agencies must obtain an extensive amount of personal data on their clients and then store all this information, McDermott said. "There's enough data stored on an individual to ruin his life forever. But, that's not much different from what any large corporation does," he said.

The Privacy Act has forced state agencies exchanging information to develop methods of complying with both the act's regulations and those of HEW, McDermott said.

The Parent Locator Service, which states are required to have to qualify for certain federal funds, is one area where privacy requirements and HEW requirements have to be made compatible.

With the Parent Locator Service, exchange of information is permitted without the consent of the individual, but the Privacy Act prohibits exchanging the Social Security number (SSN). Without the SSN, it is very difficult to obtain the necessary data required by the service.

Some federal regulations have allowed agencies to get around this "Catch-22" by applying another: Individuals requesting benefits do not have to provide their SS numbers, but they can be refused those benefits if they don't.

The Social Security Administration (SSA) has gone to what may seem like extreme lengths in refusing to release the SS number, even when that release could benefit the individual, McDermott said. "SSA is not trying to be unreasonable; it only wants to avoid breaking the law," he said.

The Privacy Act affects data exchanged between agencies in different states and federal agencies, but the proposed H.R. 1984 would extend these regulations to both agencies within a state and private agencies.

In looking toward a future that could include H.R. 1984, McDermott suggested that public and private agencies develop an awareness of impending legislation in order to avoid problems.

Whether or not both the Privacy Act and H.R. 1984, if passed, will ultimately harm more than protect Welfare recipients is a determination that neither he nor HEW as a whole could make, Trainor said.

Climate Changed

"We're not monolithic at HEW; we don't have a corporate line," he said. The climate of the government has changed radically in the last few years, he added.

Under Nixon, the privacy of Welfare recipients was meaningless because the attitude was "that the bums should be off the rolls anyway," he said. After Watergate, the government and HEW switched to the other extreme and demanded protection of privacy above all else. "Now, we're changing again," Trainor said. The attitude of the new secretary of HEW is that "we must have accountability, but we must also guard against abuse," he said.

"There's nothing wrong with asking someone applying for aid what his income is," Trainor said. What is wrong to ask and whether accountability or privacy should be the first priority are questions Trainor could not answer. He doubted that anyone at HEW could answer them.

Child Support Law Causing DP Changes

By a CW Staff Writer

CHICAGO – The national child support legislation passed in January 1975 is causing an extensive revamping of many state welfare program systems, Jolie Bain Pillsbury, assistant to the deputy commissioner of the Texas Department of Public Welfare, said here recently.

This piece of legislation, which mandates the establishment of child support collection programs nationwide by January 1977, requires each state to set up a separate agency to deal with this program, she told the Human Services Information Systems Conference.

What the legislation means in terms of DP is the development of "an information system that can somehow mesh the time-bound requirements of legislation and information processing with the vagaries and erratic inputs of a complex, unstable and uncontrolled set of variables related to the collection-of-payments environment," Pillsbury said.

The basic objectives of the child support program are to establish paternity, locate an absent parent, obtain child support payments and enforce the payment obligations of absent parents, she said.

Some of the federal requirements of the child support program are to uniquely identify the family and children; link children to an absent parent and to Aid for Dependent Children (AFDC) payments and food stamps received; account for and control collections and disbursements; and to determine bonus payments and then make those payments.

Texas has managed to develop a working child support system which meets the basic priorities, but the system was implemented so rapidly that many of the considerations required by the law for a child support program have not been met, Pillsbury said.

The Texas system currently maintains data about absent parents and the money collected from them, retains historical data on payments, sends payment due notices (which are often not followed up), generates reports and accesses AFDC files, she said.

What the system does not do is reach those families who are eligible for child support payments but are not in the AFDC program; it also does not interface with the food stamp program, she noted.

Texas' experience can be valuable to other states developing an automated child support system, but each state must design a system that will fit into its own administrative, legislative and judicial environment, Pillsbury said.

The law imposes uniform requirements on all states for the implementation of the child support program; the impact of these requirements, however, "varies greatly from state to state dependent upon the programmatic environment of each state," she said.

The variables affecting the system design are primarily the structure and location of the child support agency in a state; the structure of the agency dealing with AFDC payments; the type of information systems already in existence which support other human services programs; the state's prior experience with child support collection; the laws and court cases relating to child support; and the attitude of the public, courts and legislature toward child support, she explained.

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DP in Human Services

Two States Find Planning Crucial to System Success

By Catherine Arnst
Of the CW Staff

CHICAGO – The key to a successful social services DP system is thorough planning with the interaction of employees in the design stages, speakers from Utah and Oklahoma told the Human Services Information Systems Conference here last week.

When Utah decided to revamp its social services system, it tried to determine what other states were doing and then adapted the best, according to Evan Jones Jr., director of the Utah's State Division of Family Services.

The state decided to transfer Maine's system to its own operation and developed the capability of generating both the required federal reports and output reports similar to Maine's.

But "we wanted to focus on results," Evans said. "We wanted to utilize the computer as more than a high-speed printing press."

To achieve that goal, the state added a few refinements to the system it borrowed from Maine.

One of those more important was a master service unit, which Evans defined as a half-hour of an employee's time spent on each case. All cases are defined in terms of this master service unit so that the amount of time spent in client contact as opposed to administrative chores can be tracked.

A number was also assigned to each worker in order to monitor his workload, Evans said.

"Our goal was for workers to spend two-thirds of their time in direct contact with clients," he said. To achieve this, Utah had to keep paperwork to a minimum and "definitions had to be kept as simple as possible."

'Is It Necessary?'

The main criteria established for each data element was the question, "is it necessary?" Evans said. Utah wanted a one-page form of client information for input into the system; it ended up with two pages.

With those two pages, the state was able, with the aid of a management systems firm, to develop a system that can keep an inventory of all the social services programs available; maintain a history of the services used and the payments made to each client, both individually and as part of a family unit; and track the number of master service units expended on each case and what type of service those master units represent.

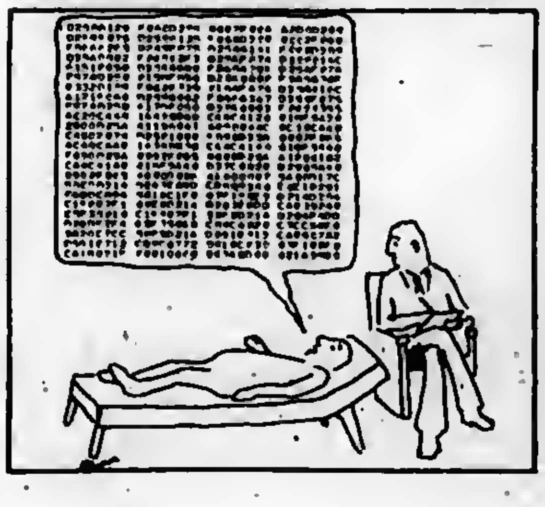
Unfortunately, the state's chosen starting date for its system was about six months too soon, Evans said, and the operation had to be run by hand until all the bugs were worked out.

Some of those bugs included program and support elements that weren't ready, and a lack of consideration of the impact the end of fiscal year, which was the same as the system's proposed starting date, would have on the computer facility.

Evans had several words of advice to other states planning on streamlining their systems; the most important one was "to be sure and involve the staff using the system."

In addition, the user should "determine what type of finished system you want and set standards that you want that system to meet," he said.

"Define your data elements in writing and keep your staff informed of where you are going, because it might take two years longer than you expected to get the system up," he warned.



Involvement of the staff in Oklahoma was an important element in the success of the social services system in that state also, according to Philip J. Smith, head of the Management Information Division of the Oklahoma Department of Institutions.

"Our system was developed by the push and initiative of our staff," Smith said. While developing its system, Oklahoma had meetings every month with all levels of DP employees, he noted.

His state's two main considerations in developing the system were the benefits to the client and the simplicity of reporting data, Smith said. Its solution was teleprocessing.

Oklahoma now has IBM 3270 terminals installed in all 77 of its county offices. "Our accuracy has improved and the status of all services can be determined readily," Smith said.

Privacy is maintained through the location of the terminals and various levels of sign-on codes, he added.

The state uses a hierarchical structure for its data, and access is through a combination of index sequential and direct-access methods, he said.

The software is based on a module system, he explained; whenever a data segment has information added or deleted, only that one segment is affected.

An especially useful feature of Oklahoma's system is Alpha X, an alphabetical cross-reference, Smith said. With this feature, a record on every client for every service in every department can be accessed.

Smith believes the reason for the system's success is that "the social services system in Oklahoma is not considered a property of the DP department but of the Social Services Department," and an employee of the Social Services Department was devoted to the planning and design of that system.

Both Evans and Smith agreed a system must be responsive to users' demands.

"Keep in mind that a systems is a means, not an end, and revise as you go along," Evans advised.

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Would Rate Job Seekers' 'Suitability'

UK Job-Matching Plan Attacked on Privacy Grounds

By Joe Hanlon
Special to Computerworld

LONDON – A computerized job-matching scheme which would rate job seekers according to their "suitability" for employment has drawn considerable protest here.

The pilot project, slated to begin this summer, "is in danger of running contrary to the principles laid down in the white paper on 'Computers and Privacy' [CW, Dec. 31-Jan. 5]," according to Gerry Fisher, deputy president of the British Computer Society.

And the Civil and Public Services Association has said its members, who work in employment offices, will refuse to do the ratings.

Under the proposed system, job seekers would be rated A, B, C or D. While employment officers have always done informal ratings, this is the first time the ratings would be formalized and passed on to other people.

The pilot project will use a Honeywell 66/20 to do on-line real-time job matching at 14 East London employment offices which annually place almost 30,000 people in jobs.

If successful, the matching project will be expanded to all of London.

Initially Similar

For the job seeker, the procedure will initially seem little different than it is now. As at present, the employment officer will take down details about the applicant.

Instead of searching through a file box of slips of paper for jobs, however, the officer will input the data via CRT and immediately get a list of any appropriate jobs. The job seeker can then go for interviews.

The radical change in procedure wilt come when there are no appropriate jobs immediately available. At present, if an employer telephones an employment office with a job, the opening is circulated to employment officers, who decide which of their clients to send for an interview.

With the new system, the computer will print out a list of all appropriate people, listed in order first by nearness to the job and then by "suitability". The decision on who to send for interviews will be made by an officer at the employment office nearest the job.

The officer will be making choices about people he has never met, based only on data from the computer. And the officer can pass over nearby people with low suitability ratings to choose people farther away with higher suitability ratings.

The suitability rating will be based on job stability, employment record and "realism." But the Employment Services Agency, which will run the system, refused to say if a person could see and challenge the rating, although the white paper said this should always be done.

Suitability will be listed on the CRT screen as "JOB CAT," so it is not clear how many people will even know what it is.

Data from employment offices is available to social security and welfare officers under many circumstances, and observers believe it likely that "suitability" ratings will find their way into many welfare files. Employers will probably be permitted to ask for certain suitability ratings, and thus they too will find out this information.

The Manpower Services Commission, which runs the Employment Services Agency, announced last month it had approved the use of suitability ratings. The commission attached particular importance to the review procedure, which would obviate any possibility of the so-called "tag-for-life."

This review procedure will require that people who do not get jobs within a fixed period be interviewed by a different employment officer who can revise the computer entry.

But the British Computer Society is still unhappy. The scheme "might eventually invalidate the claims made in the white paper as to the strict controls exercised in the public sector on personal data. Coming as it does at the height of the privacy debate, it could possibly seem a rather rash proposal," Fisher commented.

According to Fisher, one of the biggest objections is that the Manpower Services Commission made the decision in secret – despite the white paper's argument that such choices should be made publicly.

The Manpower Services Commission "knew the white paper had been published, yet it chose to make its decision privately, leaving it to be dug out by journalists. Even if it is a perfectly good scheme, by failing to discuss it publicly it is asking for every bit of trouble it is going to get," Fisher said.

DPMA Polls Members On Educational Needs

PARK RIDGE, Ill. – The Data Processing Management Association's (DPMA) Education Foundation is currently surveying the society's members to determine their educational needs and desires.

The survey, mailed to all 23,000 DPMA members in February, is considered the largest and most comphrehensive of its type the society has conducted.

The Education Foundation was established "to provide leadership in identifying educational opportunities that will advance the information systems profession," DPMA said.

Its immediate objective is the dissemination of information among technical societies and the information systems community. The survey is the first step in the foundation's efforts, the association added, noting the results of the survey will be published in *Data Management*.

In the future, the Education Foundation plans to seek grants to conduct special studies, the results of which will be published as monographs, magazine articles or special reports, DPMA said.

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2. The content was selected based on an analysis of the tasks normally done by a COBOL programmer in industry. That's why these books contain everything of use to the average programmer and very little that isn't. Because the books emphasize DOS and OS considerations, they are ideal for System/360-370 users. But they can also be used on other systems since the book is based on 1968 and 1974 ANSI specifications. The only major content omissions are sort, segmentation, and report writer.

3. The books are organized in the most effective way possible for a programming course. Quite simply, a complete subset of COBOL is presented in the first two chapters of the book. After this, all material is organized by function (debugging, table handling, subprogram linkage, etc.). As a result, the student always sees the relationships of the parts.

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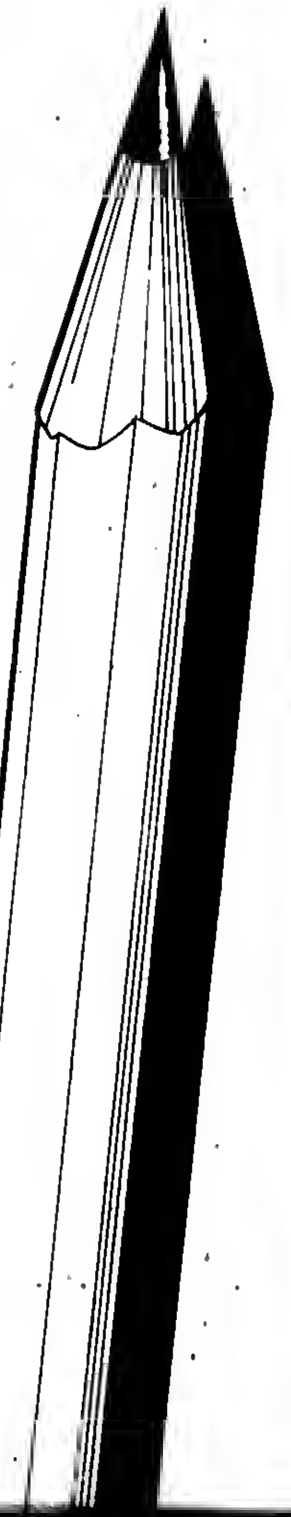

GCCA Sets D.C. Conference Next Week

WASHINGTON, D.C. – The spring conference of the Graphic Communications Computer Association (GCCA) at the Shoreham Americana Hotel here May 19-21 will offer a theme with a twist on the bicentennial slogan.

"1966-1976: 200 Years of Progress" will focus on management, technology utilization and capital investment criteria of graphic communication.

Societies/ User Groups

Attendees will include newspaper, magazine and book publishers, software specialists and commercial printers and typesetters, the GCCA said.

Concurrent sessions at the conference will include an editorial, composition and prepress program; a production automation and distribution program; and a management planning and control program.

A vendor exhibit will also be part of the conference.

Further information is available from Norman W. Scharpf, GCCA executive director, at 1730 N. Lynn St., Arlington, Virginia 22209.

ACM Has Guide to DP in Colleges

NEW YORK – The Association for Computing Machinery (ACM) has published the *Administrative Directory of College and University Computer Sciences.*

The 100-page booklet contains a listing of the names and addresses of approximately 300 heads of computer science departments and 900 directors of computer centers at universities and colleges in the U.S.

It also includes information on the degree programs offered and on-site computing equipment.

The directory costs $5 per copy for ACM members and persons listed in the directory and $7.50 for others. Copies can be ordered from the ACM Order Department, P.O. Box 12105, Church St. Station, New York, N.Y. 10249.

NCC Plans Services for Deaf

NEW YORK – Interpreting services will be provided for deaf DPers attending the 1976 National Computer Conference (NCC) here June 7-10.

Sign language interpreters were used with success at the 1974 and 1975 Association for Computing Machinery (ACM) conferences to help deaf DP personnel who have difficulty finding educational opportunities structured for them, according to Steve Jamison, vice-chairman of the ACM Special Interest Group for the Physically Handicapped.

At NCC, a special session on "Computers and Sign Language" will feature speakers from several colleges which have programs for deaf students.

Interpreters will be provided at the technical sessions at no charge, Jamison said.

Further information is available from Jamison at 1530 Page Mill Rd., Palo Alto, Calif. 94304.

Call for Papers

THIRD ANNUAL COMPUTER GRAPHICS CONFERENCE AND EQUIPMENT DISPLAY, Nov. 3-4, Detroit.

The Engineering Society of Detroit is seeking papers on computer graphics technology aimed at managerial, engineering and architectural personnel in both large and small firms.

A brief abstract must be submitted by June 1 to Evelyn Simon, conference manager, Engineering Society of Detroit, 100 Farnsworth, Detroit, Mich. 48202.

SIXTH ANNUAL CONFERENCE OF THE ASSOCIATION OF COMPUTER PROGRAMMERS AND ANALYSTS (Acpa), Nov. 10-12, Washington, D.C.

Papers related to the conference's theme, "Pathways to the Future," are requested.

Subject areas include career development, on-line interactive search systems, software structures for data base management, packet-switched networks, software auditing, internal controls and security, women in DP, teleprocessing using satellites, networked minicomputers, microprocessors/microcomputers and unionism in DP.

Papers must include an abstract not exceeding 150 words and the total paper should not exceed six typewritten pages, excluding illustrations. Papers should be sent by June 1 to David R. Skeen, Acpa-6 program chairman, at the Office of Naval Research, Room 232, 800 N. Quincy St., Arlington, Va. 22217.

COMPUTER NETWORKS: TRENDS AND APPLICATIONS, Nov. 17, Gaithersburg, Md.

The IEEE Computer Society is seeking tutorial papers describing practical results with computer networks and networking systems or presenting new research results.

Suggested topics include multicomputer, value-added or terminal-oriented networks; network design or access techniques; economics, management, or measurement of networks; applications and future directions for networking.

Three copies of a 1000-word abstract must be submitted by June 15 to Dr. Patrick McGregor, Network Analysis Corp., 9105 Westerholm Way, Vienna, Va. 22180.

INTERNATIONAL FEDERATION FOR INFORMATION PROCESSING (Ifip) CONGRESS 77, Aug. 8-12, 1977, Toronto.

Papers can be in the areas of theoretical foundations of information processing, computer hardware, software, networks, applications in science and engineering, computer-aided design, applications in management and administration and information processing and education.

Four copies of the completed paper should be sent by Nov. 15 to the Program Committee for Ifip Congress 77, Ifip Foundation, Paulus, Potterstraat 40, Amsterdam 1007, Netherlands.

Group Sponsoring DP Course for High School Dropouts

By Catherine Arnst
Of the CW Staff

PHOENIX – High school dropouts here are being given the chance to get into DP through a training program sponsored by the Phoenix Chapter of the Association for Systems Management (ASM).

The program, Project Clas (Computer Learning Aid in Systems), was started by Ralph Compton, president of the Phoenix ASM chapter, to aid young people who are currently "not at all competitive in the job market."

Project Clas will enable its students to start in an entry-level programming position when they are through with the training, he said.

Project Clas is a three-to-four-month self-instructional course which gives students "hands-on" experience in a DP environment. Honeywell donated 10 self-instructional units (the same as those used by the firm to educate its customers) to the program.

There are currently five students in the program. Three of the original students have dropped out since the program began, but they were replaced by others.

Societies/
User Groups

The students are taught an introduction to DP, programming, flowcharting, Basic Cobol, file design and disk concepts, Compton said. They work at their own pace and when they run into a problem, an ASM member can be called to help them out, he added.

Screening Test Given

There were 400 to 500 calls received by people interested in taking the course when it was first announced. A screening exam is given to choose those students most capable of handling the material, Compton said. The students in Project Clas must be enrolled in a high school equivalency diploma course also.

No jobs have been promised by area companies for the graduates; "most have a 'wait-and-see' attitude," but they have expressed interest, Compton said.

"I think the number of entry-level positions that are available to these students are really opening up," he said. "Many shops are finding they need a backup programmer to do the simpler tasks."

The program will probably be expanded in the fall to include a night course, Compton said. Currently such an option is unnecessary since most of those applying to the program are unemployed.

The program is operating without any federal, state or local funds, depending on area businesses to provide support. "This allows us more flexibility," Compton said.

"We've showed these students that we are interested; what they are willing to do afterwards is up to them," he concluded.

Calendar

May 16-18, Andover, Mass. – **Facsimile – A New Perspective**, sponsored by the Institute for Graphic Communication (IGC). Contact: Richard D. Murray, Director of Conferences, IGC, 375 Commonwealth Ave., Boston, Mass. 02115.

May 18-20, Andover, Mass. – **Business Opportunities in Satellite Communications**, sponsored by IGC. Contact: Richard D. Murray, Director of Conferences, IGC, 375 Commonwealth Ave., Boston, Mass. 02115.

May 24-25, New York – **A National Conference on the Right of Privacy: The Issues and Problems**, sponsored by the National Retail Merchants Association (NRMA). Contact: Privacy Conference, NRMA, 100 W. 31st St., New York, N.Y. 10001.

May 24-26, Pittsburgh, Pa. – **Hybrid Microelectronics**, sponsored by the University of Pittsburgh and IEEE. Contact: Minor C. Hawk, Assistant Dean, 231 Benedum Engineering Hall, School of Engineering, University of Pittsburgh, Pittsburgh, Pa. 15261.

May 24-26, Amsterdam – **Retailing, Banking and Plastic Money**, sponsored by the Ifip Applied Information Processing Group (IAG). Contact: IAG Headquarters, 40 Paulus Potterstraat, Amsterdam-1007, Netherlands.

May 25-28, Logan, Utah – **Sixth International Symposium on Multiple-Valued Logic**, sponsored by Utah State University, IEEE Computer Society and Office of Naval Research. Contact: Prof. Stephen Su, Electrical Engineering Department, Utah State University, Logan, Utah 84322.

May 27, Gaithersburg, Md. – **Trends and Applications 1976: Micro and Mini Systems**, sponsored by IEEE Computer Society and National Bureau of Standards. Contact: Trends and Applications 1976, P.O. Box 125, Columbia, Md. 21045.

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Editorials

Privacy Law Extensions

Special interests in both the private sector and in the area of state and local governments are now pushing to avoid coming under the same type of legislation that regulates the Federal government's handling of information about individuals.

At the Computer Law Association meeting recently, spokesmen for each of these groups were active [CW, May 3].

Most of these spokesman emphasized how important information is to their constituencies and contended that businesses or state and local governments could not possibly do their jobs without unlimited access to information.

It is true that information is an important commodity in this day and age and that information is important for the functioning of many businesses and for local governments.

Privacy legislation will not change this.

Privacy legislation, however, will protect the rights of individuals in relation to these information systems, and these individual rights must come before the rights of business or state and local governments to collect information.

Personal information that is of legitimate interest and is truly needed by an organization could still be collected under even the most stringent laws.

The individual would be protected, however, since he would be informed of the use to which that information would be put and would be protected from other uses of the same information.

The enactment of privacy laws covering local governments and the private sector will force those areas to rethink the way they collect information and use it.

In some cases such a reappraisal will be traumatic.

Many organizations will clearly have to stop collecting some information they now collect as routine, and all will have to provide better safeguards on access to personal data than is normal today.

In many ways this can be good for the organization that takes a positive approach to the problem.

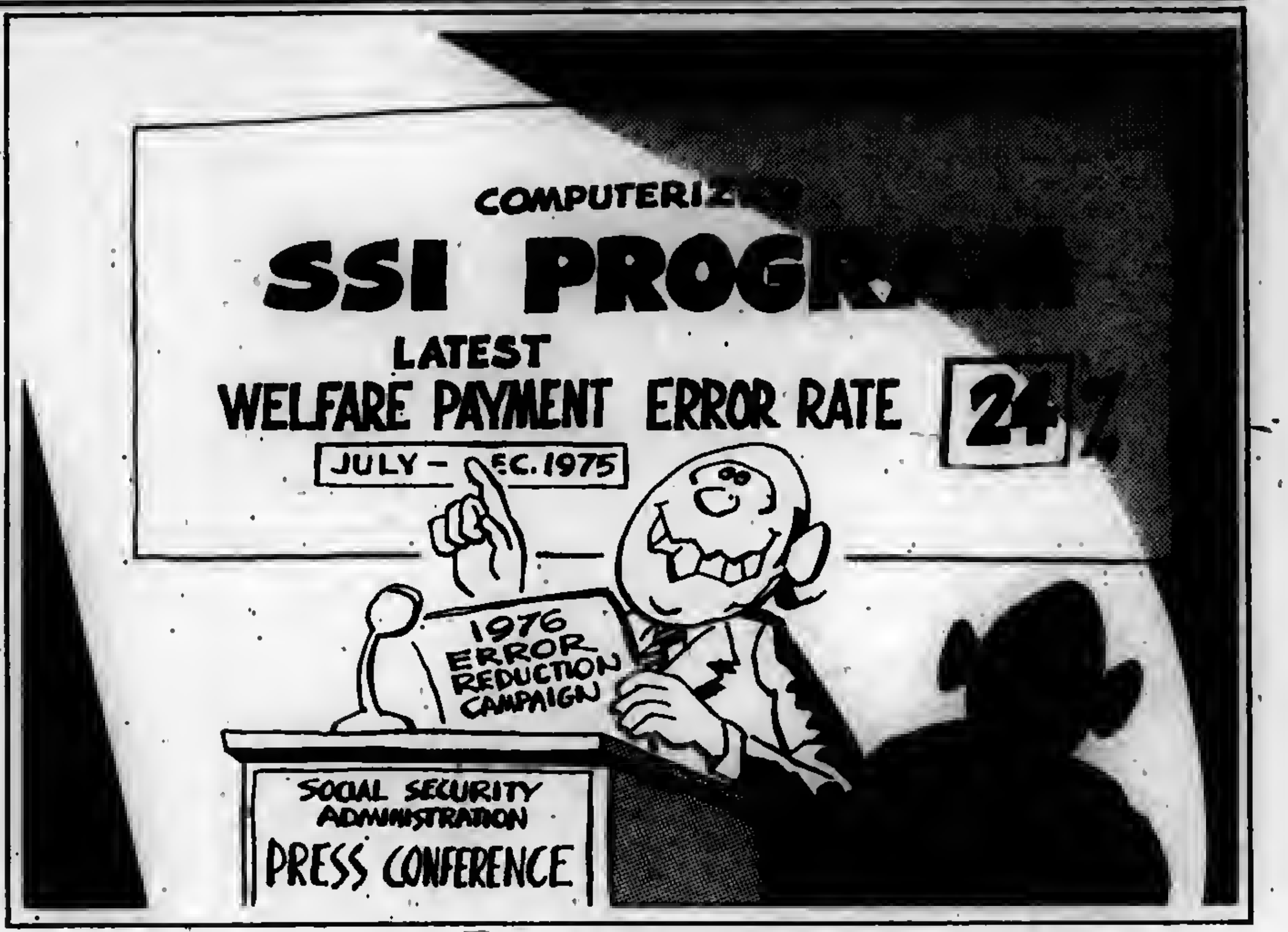
Often information systems have grown with little real planning and thought. The coming passage of privacy legislation gives a firm the opportunity to take a hard look at the data it is now collecting on individuals and to decide how much of it is really necessary and how much is being collected just "because it's always been done that way."

All data processing departments could spend their time constructively in planning how to meet privacy regulations and not in bemoaning the fact that such legislation is likely.

The mood of the country is for increased personal protection vis a vis large institutions, which are often represented by information systems which crave more and more individual information.

Privacy legislation is likely for the private sector in the not-too-distant future.

Operations that plan for it and meet the challenge of privacy positively will succeed and do well in the new environment. Those who resent the coming legislation and look upon it as a burden rather than an opportunity will not do well – and they receive their just desserts.



*'To Err Is Human, to Forgive, Divine;
So You Forgive Yours, And I'll Define Away Mine!'*

Letters to the Editor

Marketplace, Not a Committee, Should Decide Merits of EFT

A recent editorial [CW, April 26] stated that there is a policy vacuum at the federal level with respect to the development of electronic funds transfer (EFT) systems.

A fear was expressed that many systems "may be a fait accompli when policy is finally made."

To avoid such a possibility, the recommendation was that "a moratorium on the initiation of new systems is the only way to slow the explosive growth of local experiments in EFT."

We do not see local experimentation in EFT as a threat to the public interest. The mechanism of the marketplace, selecting among competing alternatives, will determine the EFT system (or systems) best meeting its needs. The unsuccessful EFT experiments will be eliminated; the successful ones will grow in influence and be adopted by financial institutions. In other words, we should allow free market influences to prevail.

No group of people deliberating on EFT in Washington, however talented, can approach the collective wisdom of this market. The only legitimate role for Washington is to assure that no bank, group of banks or other entity is able to use EFT to obtain (or maintain) a monopolistic position.

Further, no institution, particularly the government itself, should use EFT to violate the rights of personal privacy. Except for those considerations, the form of the future EFT system should be determined by the market without constraints applied by a federal bureaucracy.

Nicholas G. Hesse
EFT Systems Planning Department
Maryland National Bank
Baltimore, Md.

Two Classes of Personal Data

I wish to dispute a claim made by Herb Grosch [CW, "Who Owns the Data?," April 26]: "In the end, data about a person will inseverably belong to that person."

Crucial to any determination of valid property rights in any entity is the question of how that entity is acquired. In the case of property rights to data about people, I believe this consideration should inevitably lead to (at least) two classifications of data about people and thus to two different sets of rules defining the property rights.

A simple example should make the distinction clear: Suppose I go to a bank and fill out an application for a loan. I provide certain information about myself – my address, marital status, annual income, assets, etc. – to the bank for the sole purpose of being granted a loan.

I would not otherwise provide this information to the bank, and I have not given it gratuitously. I retain the property rights to this information.

The bank should use it only for the purpose of deciding whether to grant me the loan I request.

Now suppose I default on the loan, once granted. This is information about me, but I didn't provide it to the bank.

The bank experienced it, or earned it, at perhaps considerable cost to the bank. This information, that I defaulted on a loan of such and such a value, is rightfully the property of the bank. The bank should be able to dispose of the information as it sees fit.

I certainly hope our legislative and/or judicial systems make these distinctions when they get around to establishing and enforcing the property rights to personal data.

John Kannarr
Glendale, Ariz.

Data Past

Five Years Ago
May 12, 1971

SEEKONK, Mass. – The principles of shared software, distributed data processing, cable television and computer-assisted instruction will combine to form the "wired city" by 1975, according to speakers at a meeting of the Association for Systems Management.

– – –

WHITE PLAINS, N.Y. – IBM announced an upgrade to the 2260 CRT terminal system with the 3270 alphanumeric CRT, which featured an improved hard-copy printer and 1,920-character display, IBM said.

Eight Years Ago
May 8, 1968

CAMBRIDGE, Mass. – The new technology must help solve social problems, Charles C. Wilson, chairman of Xerox Corp., told Harvard business scholars at a series of lectures sponsored by the Diebold Institute. "The resources exist to solve the problems of poverty, urban blight and perhaps even racial strife. If the problems are not solved," he warned, "I have the uneasy feeling that the role of private enterprise may be downgraded and replaced by something else."

– – –

WASHINGTON, D.C. – Maintenance of computer equipment by the Federal government was costing $50 million each year, according to a General Accounting Office report. More emphasis should be placed on in-house maintenance to cut these costs, the report said.

Can Any Good Thing...

"...come out of Nazareth?" said Biblical doubters. And in our own parched land, with only a few scattered olive orchards of honesty, the same cynical viewpoint prevails. Can anything done in Washington really be well-intended? Or are there Metternichean overtones to everything?

I must say the CW lead story on John Eger, the Office of Telecommunications Policy, and EFTS [April 19] gave me fresh hope. I don't know Eger personally, and references to him by the Washington liaison office of AFIPS have been fairly neutral. But his reported concern about Federal incursions into the privacy of the citizenry, via Federal Reserve Board centralization of electronic funds transfer subsystems, gave every indication of genuineness. To see such concern in the White House is heartening.

Probably the basic thrust of the Board, and similar bank-oriented agencies elsewhere in the federal establishment and out in state government, is the old American syndrome: if we can, we should! It took us to the moon. But it dams beautiful, wild rivers and pushes us into God-forsaken adventures like Viet Nam. It builds Amdahl's goody box – but also brings variant software from every ambitious compiler designer.

But I digress: what I meant to write was, the fact that it would be *easy* for the Fed to play such games is no justification whatsoever for doing so. We should say, "Think first whether you want such a dangerous weapon, not how much it costs to acquire.",

Wouldn't you think, in the reawakened memories of Watergate, even the least sensitive bureaucrat would hesitate? Yet there goes the Fed, plunging into unnecessary controversy, asking for future trouble: amazing!

An especially interesting speculation for me is the possible inhibiting effect of Federal Reserve Board ambitions on the obvious intention of bank holding corporations to gather up the EFT and future broader money/credit/service network responsibiilty. There are independent credit nets already, both the plastic money giants and the credit verification people. There are hungry nonfinancial data networks (GE, CDC and CSC, for instance). There are retail chains like Federated. None of these are governed or threatened by the Board, and while the banks and the Fed fight it out for dominance, with the latter holding a powerful whip over the former, the ITTs and the DATRANs will forge ahead. I'm not clear that they shouldn't, you understand!.

Eger doesn't want to question the basic EFT idea, I gather, nor will the newly manned EFT Commission. He wants to keep federal agencies, and especially FRB-like agencies, out of the central picture. I would go much further, and have the commission begin by considering the broad social desirability of EFT itself: the civil liberties issue, the automation/unemployment issue, the freedom-to-play-games-with-the-"float" issue, and so on. Meanwhile their technical hirelings can be costing up the various proffered alternatives, and perhaps a few of their own.

Also, very different kinds of consultants (the social science and public relations sorts) should be canvassing and extrapolating public resistance. The grocery code fiasco gives us clear warning! I doubt very much if average bank customers, let alone the marginal poor folk who will be drawn in when their social security and welfare checks are transmitted via computer, care one iota for the profits or the operating difficulties of Citibank or the B. of A.

What they fear is impersonality, difficulty in asking questions and correcting errors, further dehumanization. What *I* fear is an electronically and sociologically broad band channel from the nation's financial transactions to the IRS and the cops and the FBI and the Secret Service. Easy, cheap – and *very* quiet!

Remember how slow Ford has been to appoint the Commission? Remember how narrow the commissioners' backgrounds have been? That means the advisers who arrange priorities and write presidential statements and recruit appointees are either corrupt – that is, want the EFTS to go ahead before the general public sees its danger – or stupid – don't realize the public weal is even involved. In Kennedy/Johnson days, I would be sure: corrupt. With Jerry Ford and his horrid precursor, "stupid" is certainly possible.

That is why the Eger initiative is so important. If indeed the White House has shunted EFT matters aside through ignorance, even an appointee thereabouts who favors private EFTS excessively is better than disinterest.

Everyone at CW, and a fair gaggle of professionals in AFIPS and its member socities, is watching this scene closely. The enormous competition shaping up between banks and credit outfits and retail chains and computer service companies gives those of us who care about human beings cracks in which to insert our pry bars, and leverage with which to exert our otherwise puny influence. There is still time before we have to man the barricades!

Herb Grosch

Comma-Control Method Bars Name-Suffix Blunders

When candidate Gerald R. Ford sent out his campaign letters *("I am writing to you today to personally ask...")*, one went to "R.F. Morrison CDP." Morrison was then saluted (on three occasions in the letter) as "Mr. CDP." Similarly, the American Express senior vice-president of marketing wrote to "Mr. R.F. CDP, County Monroe." All of which made R. Frank Morrison, CDP, think about the need for handling suffixed names, including the generational ones, such as Jr., etc.

The Taylor Report

By

Alan Taylor, CDP

He came up with a good, seven-step approach, based upon the use of the commas. This is reproduced in the box. Morrison puts the last name first with a comma after it and then bans the further use of commas in the name fields unless some suffix appears.

Comma-Control Virtue

The comma-controlled approach is a good one which really says that the salutation part of the name must be distinguished in some specific way so that it is correctly used. That part is simple. What I particularly noted, however, were the last two steps.

I have already talked about banning the use of commas as field separation characters. This is the essential basis of the scheme. Without this comma ban there is little in the system. With it, however, a valuable blend of the human and the logically acceptable has occurred. Commas are humanly acceptable in name fields, but they are not absolutely required by humans. Commas are therefore available without problem to handle logical requirements the computer listing has imposed.

This use of unobtrusive, acceptable characters for giving unobtrusive, acceptable control is superior in design to efforts that require the use of special logical characters. Such characters, if printed, will stand out and shriek.

Migration Path

Morrison's sixth step tells how the user gets from other types of lists to a comma-controlled list. The inevitable problem facing all designers of migration paths is "How do you get there from here?" Many otherwise very good approaches have been lost when problems arose in getting to some desired starting place.

In itself, the rule is quite reasonable. It points out that some eyeballing will have to be done, and gives some rules about when it will be necessary, which are items that can be easily programmed.

It provides for estimating how much work will be involved in setting up new lists in the method. It is a good and a necessary clause.

But these two rules are not like the first five. They are no more like those than a suffix such as CDP is like the salutation name Morrison! And, like suffixes, they need special treatment in the write-up because they are often put in the wrong place.

The rules that govern the limitations in use of a system, (no commas other than system ones) and the migration effort (eyeball on special conditions) are key elements which should be separated for easy reading. They are properly associated with the statement of the systems use and virtues.

1. Name fields are free-format, last name first, as is a common current method of storage.
2. A single comma is required following the last name and preceding the first name. Spacing on either side of these commas should be regulated, and normally standards would call for no spacing on either side of it.
3. If a name suffix exists, a second comma separates the name suffix from the rest of the name in the same manner as the separation between the last and first names. Example: Morrison, R. Frank, CDP.
4. The string-handling transposition always assumes that the entire string up to the required first comma is the last name. What follows is assumed to be the first and second names until either the second comma or the end of the field is reached. The second comma indicates that the balance of the field, if any, should follow the last name when being prepared for full-name printing.
5. Input editing should check that there is at least one and not more than two commas. The commas cannot occur in the first position, nor should any numbers or special characters, other than hyphens, follow.
6. List translations from another format should be eyeballed if they contain more than two nontrailing blanks or any special characters other than periods.
7. Free-form name and address input may not use the comma as a field separation character.

The description above shows a different approach to handling name suffixes such as Jr., III, Ph.D., etc.

Limits and migration requirements are items which are often buried at the bottom of lists. I think that in writing up new ideas it is better practice to include them in a lead-off summary rather than listing them as though they were another automatic path of a routine.

The advantages and the costs would have been much clearer if Morrison had started out with a statement such as:

"The controlled use of commas as separators in name fields can prevent confusion between last names and suffixes such as CDP. Files currently existing with uncontrolled comma use can be converted, although eyeballing on a name-by-name basis will be required in some specific cases."

Try bringing up these limitations at the top of your technical papers. It really does help to bring them into focus.

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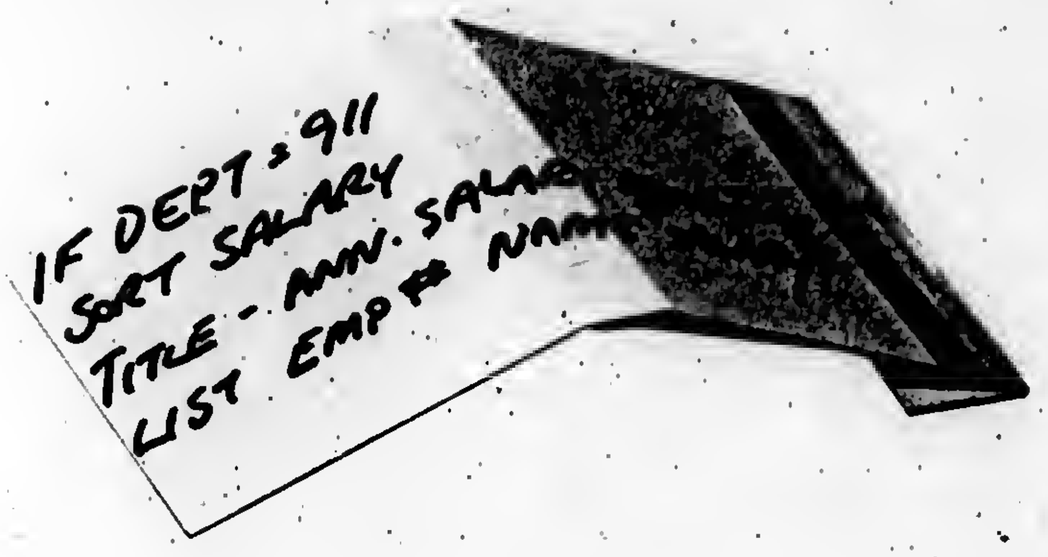

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Letters to the Editor

Series 1000 Rate Increase Chilling Reminder to Users

The March 29 article on AT&T's Series 1000 rate increase was a chilling reminder that users should maintain their network system approaches at or near prevailing commercial practice.

Failure to perform timely upgrades can leave a system in a very vulnerable minority class.

The rate increase, however, was not a result of the Federal Communications Commission's (FCC) ordering AT&T to bring all of its interstate services up to the same rate of return, as the article reported. That approach, the so-called fully distributed cost concept, is thus far only a proposed FCC decision, as advocated by the Common Carrier Bureau.

R.G. Berglund

Cherry Hill, N.J.

Let ACM Members Decide

It was disgraceful to witness Jean Sammet's last-minute efforts to block Herb Grosch's richly deserved election as president of the Association for Computing Machinery (ACM).

Having failed to keep his name off the ballot, she has now orchestrated a mammoth and highly unethical direct-mail campaign to elect Carl Hammer.

Why doesn't Sammet let ACM's highly intelligent membership decide between these fine men?

Gordon Smith

Greenwich, Conn.

CDP No Guarantee

In response to the April 12 article on the Certificate in Data Processing (CDP) as a "credential reliable enough to serve as a basis for licensing or other regulations" – if the idea weren't so frightening, it would be downright laughable.

The CDP exam measures data processing proficiency and does that very well. Yet the respondents who saw the CDP as a viable basis for regulation used the words "quality" and "responsibility." Are we to believe that quality and responsibility are the logical products of mere proficiency?

Remember, the CDP exam not only measures a programmer's ability to produce valuable time- and energy-saving data processing systems. It also measures his ability to use the computer to embezzle. No exam or attempt at regulation is going to bolster an individual's sagging morality.

In my view, this is one step in the Society of Data Processors (SCDP) premeditated plan to impose a "closed-shop" concept on the DP industry.

Barbara Floyd

Denver, Colo.

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Monitor Cuts CPU Time 90% on Broker's Daily Run

By Don Leavitt
Of the CW Staff

NEW YORK – An on-line system for displaying current customer account information on CRT terminals in local offices had been developed and was ready for implementation early last year at Merrill Lynch, Pierce, Fenner & Smith, Inc.

But the system had a problem, according to Michael Grackin, manager of performance measurement for the brokerage house. The program that selected offices and customer accounts for the data base took so long to run each night that the file wasn't ready for business the next day.

Early attempts by the programmer working on his own to improve the data base selection program were to no avail, Grackin said. But the company had previously acquired the Strobe program performance measurement package from Programart Corp. in Cambridge, Mass.

Strobe monitors a program while it is executing and then prints a profile report showing how the problem program spends its time on the computer. By highlighting the time-consuming areas of the run, Strobe in effect leads the programmer to what might be the most useful modifications.

Savings Exceed $300,000

Using its normal computer cost algorithm, Merrill Lynch has estimated that the improvements made in this one program have achieved an annual savings in excess of $300,000, Grackin said.

The improvement effort consisted of running the program while Strobe was monitoring it, checking the Strobe output, modifying the program and rerunning with Strobe.

Specifically, by using Strobe, the company cut the elapsed time required to create the data base customer accounts from more than four hours to just one hour. CPU time was chopped 90%, from 120 to 12 min/day.

Grackin also found another payoff, one that couldn't be quantified, but that bodes well for the future. The Merrill Lynch programmers learned some valuable lessons about the relative effectiveness of the various PL/I programming techniques, he said.

The first Strobe report showed the run was taxing the company's IBM 370/168, but only 20% of the time was spent in PL/I code directly. More than half the CPU cycles were used by two library routines in the IBM-supplied logic.

Reference manuals indicated these routines were used to compare unaligned bit strings. The programmer had used bits for setting switches to indicate which Merrill Lynch offices were to be included in the data base.

The format of the office switches was changed to character representation and "a few other changes" were made at the same time, Grackin said. Although the run timings overall weren't much different than before, the bit string manipulation routines had virtually disappeared.

Another library routine, however, had shown up as the heaviest user of CPU time. This one handled data structure mapping or computing the size of the data, which varies from one account record to the next. The routine was apparently invoked because in the "incidental" changes, the programmer had defined a variable-length record with PL/I's REFER option.

The programmer determined he could add half-a-dozen lines to explicitly compute the variable size and thereby avoid the REFER option. With that change, a third Strobe run produced the hoped-for results in performance improvement.

Run time was down to slightly over two hours and CPU time had fallen to the 12-minute mark. But other parts of the Strobe report showed new ways the run elapsed time could be shortened, Grackin said.

Tape Swapping

The time distribution portion of the Strobe output showed that for "considerable periods of time" – in Grackin's words – the computer was prevented from working on the problem program.

The Merrill Lynch team surmised that the wasted time was spent waiting for tape reels to be rewound and replaced. Through JCL changes, they assigned two tape drives to each file to eliminate the reel swapping time.

A Strobe run with the extra tape drives showed elapsed time down below an hour while CPU time remained at the 12-minute level achieved earlier. The tuning effort had been successful.

ADR Adds On-Line Support to 'Librarian'

PRINCETON, N.J. – A conversational version of the source program management system from Applied Data Research (ADR), the Librarian/Online (LIB/OL) allows users to perform all Librarian functions from IBM Customer Information Control System (CICS) terminals.

In addition, LIB/OL provides on-line data preparation, editing and remote job entry facilities, ADR said.

There are two versions of LIB/OL: BX and IX. LIB/OL-BX performs updates to a source program library by a remotely scheduled batch execution of The Librarian.

LIB/OL-IX executes The Librarian during the programmer's terminal session so that the results of updating the library can be immediately verified. The IX execution is done within a CICS partition. LIB/OL-IX has hot reader support for DOS/VS, a spokesman added.

Both versions allow the programmer to display all or a portion of a program on a CRT screen and browse either forward or backward through the program.

A split-screen design lets the programmer see source statements on the lower portion while updating them in the upper portion.

The generalized remote job entry capabilities of LIB/OL allow programmers to prepare and submit jobs to OS or DOS from a terminal.

LIB/OL, like the batch Librarian, is operational under OS and DOS.

A fully-supported option of The Librarian, LIB/OL can be purchased on a permanent basis. The price of LIB/OL-BX is $1,700; LIB/OL-IX, is $3,500. Monthly rental plans are also available. The batch Librarian and CICS are prerequisites to LIB/OL.

ADR's Software Products Division is at the Route 206 Center, CN-8, Princeton, N.J. 08540.

Mark IV Table Lookup Enhanced

CANOGA PARK, Calif. – The Advanced Table Lookup (ATL) special feature recently made available to Mark IV users by Informatics, Inc. provides them with several facilities, according to the vendor.

In particular, ATL allows the user to encode/decode information to simplify internal handling, to reduce file sizes by storing multiuse data only once, to search tables with a variety of logical operators, to use fewer entries to define tables which still produce desired results and to report results in any specified format, Informatics said.

The feature supports three table types – displacement, sequential or binary – and five ways to search the tables. Both data translation and data transformation capabilities matching values, nearest values – with a choice of high or low or values derived by linear interpolation.

Automatic table lookup operations can be specified by defining a result field once, when the file is defined. All subsequent references to that field in any Mark IV request cause the table lookup operation to be performed "transparently" without any further action by the user.

For more complex applications where processing or selection criteria require it, table lookup operations can be performed procedurally within a Mark IV request. A single statement is all that is required, according to Informatics.

The single-statement entry can be coded to find table results equal to the search arguments, or equal to or nearest the argument. Alternatively, users may seek equal to or nearest and bigger, or equal to or nearest and smaller than the search argument.

Otherwise ATL may be used to give an interpolated value based on the table values bracketing the search argument, the vendor noted.

ATL is now available for all six Mark IV models, and for IBM 360/370, Siemens 4004 and Univac Series 70/90 mainframes.

Price of the updated table lookup – the very first Mark IV special feature was a simpler table lookup function – is $3,700 beyond the cost of the Mark IV mode itself.

Informatics, Inc. is at 21050 Vanowen St., Canoga Park, Calif. 91304.

Harris CPUs, 'Total' DBMS Linked

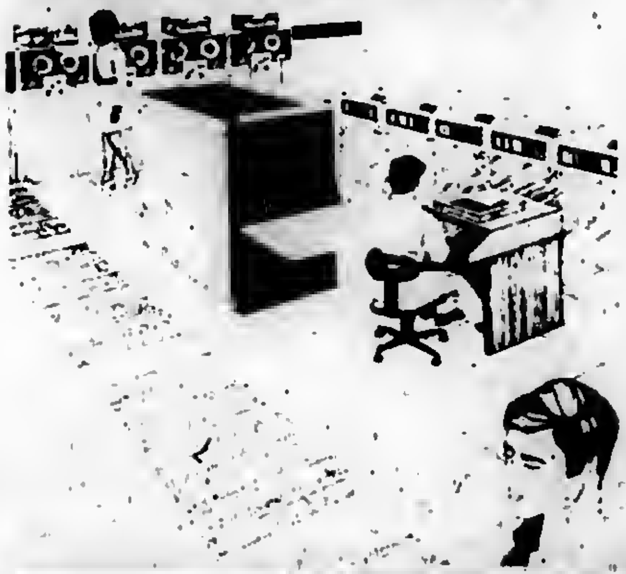
FORT LAUDERDALE, Fla. – Harris Computer Systems has announced an enhancement to its Series 100 and 200 virtual memory computer systems with a data base management system that it said will be available in early October.

Cincom Systems' Total is currently being adapted by Cincom to operate on the Harris equipment. Total is a host language system that will interface with Harris Cobol, Fortran, RPG-II and Assembler languages.

Total is also a system that will allow growth in a modular fashion, from a small single application with two or three data files to a large sophisticated data base/data communications structure with very little impact on the previously implemented systems, Harris said.

The data base management system will be available as an option. It will involve no hardware changes, the vendor said. Price of the Total system will be approximately $10,000.

Harris is at 1200 Gateway Center, Fort Lauderdale, Fla. 33309.



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'Imdoc' Handles Text or Files, Keying on 'Any Word or Phrase'

ELMSFORD, N.Y. – With the Imdoc software from the Mathematical Applications Group, Inc. (Magi), researchers working from on-line terminals can access and manipulate unformatted textual information or fixed field files, the vendor said.

Imdoc can be used to search the data base for "any word or phrase." Once documents or records with the desired phrase have been identified, they may be edited, sorted for conventional computer output or formatted for photocomposition operations, Magi explained.

The searcher is free to use "any" word or phrase because Imdoc posts each word or data element and its location to an index as it enters the system.

The size of the index is controlled, however, by the user's ability to designate – on a "stop" file – any words or phrase considered uninteresting, Magi said.

To aid searches in which the user's argument may not be identical to anything in the index, the software also provides translation, synonym, phonetic and root word search capabilities.

Both positive and negative Boolean operators are available to define the search more closely than with a single word, Magi noted.

If more than one pertinent document is located, the user may browse through the text using paging techniques.

Although Imdoc may utilize security features provided by the operating system, teleprocessing monitor or file management software with which it interfaces, it also provides some protection of its own.

User codes, for example, may be for access-only or for access and update privileges.

Imdoc has been installed and is now operational on Univac 1100 series CPUs as well as IBM 360/370 equipment, the vendor said. On IBM gear, it requires 64K bytes of storage.

The basic package is available for $60,000. Magi is at 3 Westchester Plaza, Elmsford, N.Y. 10523.

Benchmark Guidelines Issued

WASHINGTON, D.C. – The National Bureau of Standards (NBS) has issued *Guidelines for Benchmarking the ADP Systems in Competitive Procurement Environment* to help federal agencies in particular validate hardware and software performance.

The guidelines emphasize selection of samples of standard programs that are representative of the user's predicted actual workload at a minimum cost to both the user and the vendor, NBS said.

The booklet resulted from the activities of the Federal Information Processing Task Group 13, a committee established to advise the NBS Institute for Computer Sciences and Technology in its ongoing program in computer performance measurement.

The booklet, Fips PUB 42, catalog number C13.52:42, can be ordered for 45 cent/copy prepaid from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

CMG Adds D.C. Regional Group

WASHINGTON, D.C. – The Computer Measurement Group, Inc. (CMG) has formed a National Capitol Area Regional Group.

Lane Parsons of the Federal Computer Performance Evaluation and Simulation Center (Fedsim) has been named temporary chairman, according to Donald R. Deese, CMG president.

The initial meeting of this regional group is scheduled for 9 a.m. to 4 p.m. on May 19. Phil Kiviat, technical director of Fedsim and chairman of the Association for Computing Machinery's Sigmetrics, will be the keynote speaker.

Other speakers will address topics ranging from VS performance considerations to performance management. The meeting will be hosted by the Mitre Corp., McLean, Va.

CMG is a voluntary organization of practicing computer performance evaluation (CPE) analysts and professionals interested in the development of the CPE technology.

Regional groups of CMG stimulate the exchange of CPE information at the local level, by holding meetings, typically publishing a regional newsletter and actively promoting CPE, Deese said.

Parsons can be reached at Fedsim, Washington, D.C. 20330. CMG is headquartered at 4812 Sharon Road, Camp Springs, Md. 20031.

Parameters Drive Data Analyzer

ST. PAUL, Minn. – Janus, a general-purpose data analysis software system from Saunders Software, Inc., operates in batch mode, maintains sequential files of individual records made up of user-defined data items and supports parameter card-controlled manipulation of the user's data base, according to the vendor.

Developed for use in social service program evaluations, Janus has been used in mental health research and for evaluating probation services and producing hospital management reports.

But it has also been used to maintain magazine subscription lists and retrieve technical publication summaries, a spokesman said.

Working with the available commands, users can produce cross-tabluations, simple statistical reports and frequency distribution graphs, he said.

Comparison-tabluation reports, attribute checklists and user-formatted outputs are also possible with Janus, Saunders added.

Object code for Janus, for use on IBM 360/370 installations under OS, can be acquired under rental or long-term lease plans. Rental, including maintenance, is $520/mo.

A one-time fee for installation and three to five days of training ranges from $450 to $750 plus expenses of the vendor staff, Saunders noted from 1411 Simpson St., St. Paul, Minn. 55108.

SR-52 Packages Available

DALLAS – Users with the Texas Instruments, Inc. (TI) SR-52 programmable calculator can now buy four software libraries – covering statistics, mathematics, electrical engineering and finance – from retailers.

The libraries list for $29.95 each. TI can be reached through P.O. Box 5012, MS/84, Dallas, Texas 75222.

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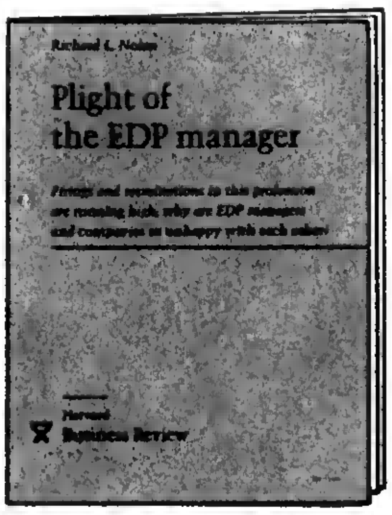

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Performance Management—Part 1

All Facets of DP Environment Must Be Part of Plan

By Larry E. Hart
And Dan Coapstick
Special to Computerworld

In today's complex data processing environment, a formal program for performance management is essential to provide maximum service for every dollar invested.

Performance Evaluation

Both the state of the economy and the increased sophistication of computer managers have contributed to the increasing interest in computer performance evaluation (CPE) and performance management.

Technology provides the capability to increase system productivity, to increase growth capacity and to extend a system's useful life without necessarily increasing the DP budget.

Performance management encompasses considerably more than only a CPE effort by systems personnel. It must address the levels of performance for every facet of the DP function, including applications development, maintenance, planning, finance, the user community and, of course, the DP complex itself.

Since each of these functions affects and coordinates with the DP environment, they should both comply with and acquire the benefits of an appropriate performance management program.

Most Pressing Question

The development of a comprehensive program for performance management may be the ultimate goal of management. Initially, however, the most pressing question is "How do we get started – do we buy a hardware monitor, hire people or what?"

Actually, the first phase is to develop an understanding of what performance management is today. There are several alternatives available, including reading technical literature, attending either public or private classes, joining technical associations, talking to performance product vendors, hiring an experienced performance analyst or acquiring the aid of a performance consulting firm.

The criteria for the selection of the right method for you is your availability and budget. The simplest method is to attend a private course and join a professional society for the literature, sessions and contacts it affords.

With the background, the manager is now ready to embark on the definition of his program.

Time for Definition

At this point it is advisable to define both the program and the step-by-step procedure to be used. Program definition is the aspect most often ignored, but the lack of a program definition at this stage can have a catastrophic effect on the overall success of the program.

A valuable approach is to hire an individual experienced in the area of program definition or to contact an independent consulting firm to aid in the program definition.

It is also essential to plan to reach a total program of trending and forecasting as well as day-to-day system tuning and problem solving. It must be a comprehensive program for today *and* tomorrow.

The performance program affects today's costs and services but, more importantly, reflects on tomorrow's capability. Performance management is a proven technique for cost-effective DP management.

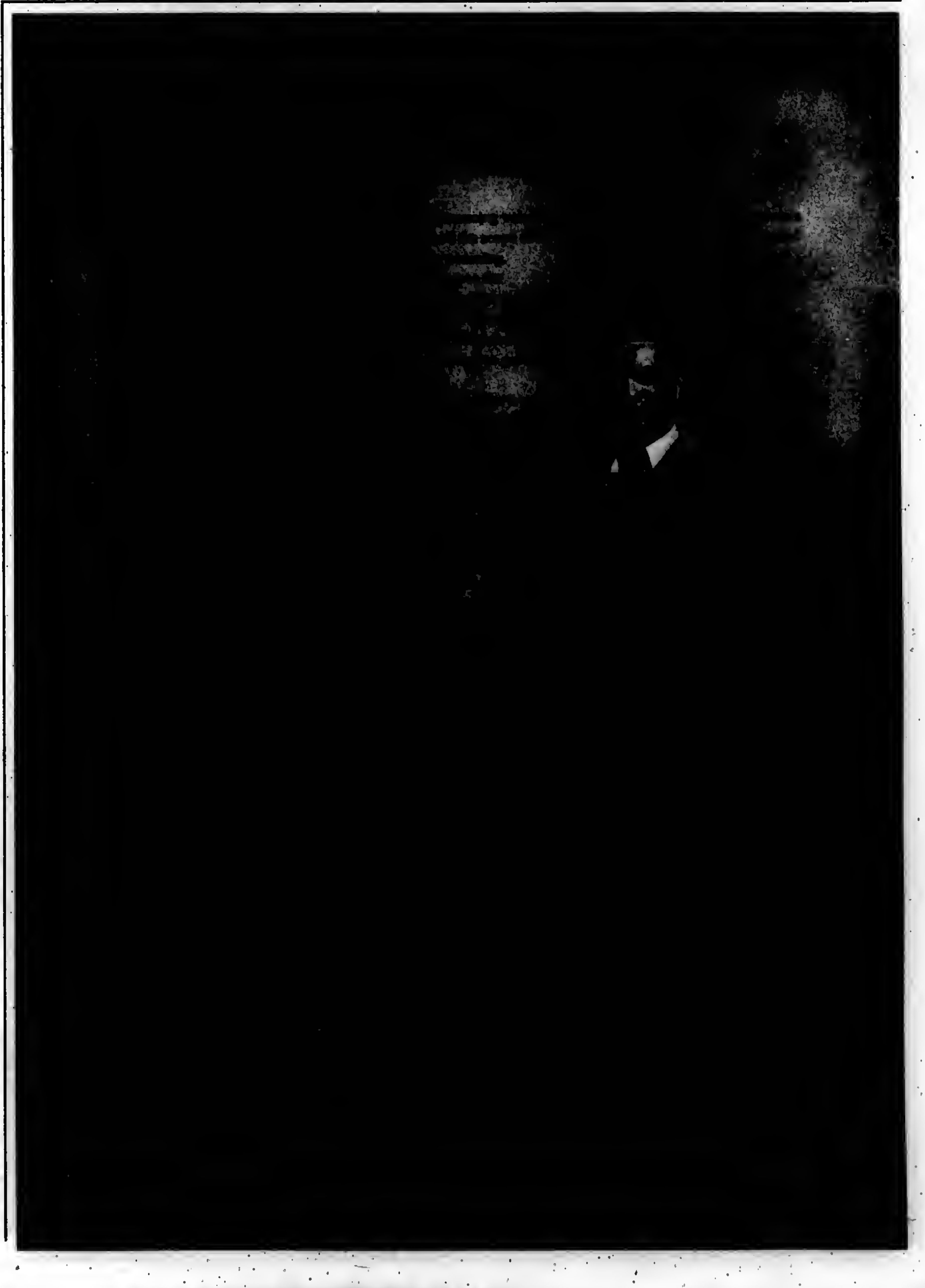
Many of the companies that claim bad experience with measurement simply disregarded the approach recommended above; they made the mistake of acquiring a software or hardware monitor to evaluate the capabilities of performance management, thinking they would worry about the required program planning later.

Plan and learn from those who are in the business – successful practitioners and experienced consultants. There is no reason to negate the benefits of a program via inadequate methods.

This article, the first in a two-part series, discusses the concept of performance management. In their next article, the authors will provide details of their approach to performance management.

For optimum success, the crucial aspects of a performance program must be management-controlled. Data collection is a means to an end, and the critical phases are program definition, measurement selection and data analysis.

Hart and Coapstick are with the performance services section of CACI, Inc.-Federal, Reston, Va.



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SRM: Users' Best Tool or Knife to Cut Their Throats?

By John J. Hunter

Special to Computerworld

Optimists have called the System Resource Manager (SRM) the greatest tool ever placed in the hands of users; pessimists have other ideas – they call it a knife to cut your own throat. Both have pretty good cases.

What is the SRM; why was it introduced and what can you expect from it? SRM is a dynamic job scheduler and resource allocator which allows installations to closely control how a job is serviced from initiation to termination (normally or abnormally, as the case may be). It is part of IBM's OS/VS2 Release 2.

While SRM is the key element in the efficiency game for Virtual Storage users, Release 2 also sports a number of system changes and additions which should speed things up considerably.

Among the enhancements are multiple virtual storage (MVS) areas, permitting each user to have his own 16M-byte virtual storage; and a hot new data-set-handling methodology called virtual I/O.

SRM possesses many features one would expect in an ideal scheduler/controller: it permits users to determine how the resources will be allocated to a job and when they'll be assigned; SRM automatically monitors the job mix to ensure that a job in a particular class gets its proper service; and SRM automatically adjusts the job mix to attain optimal system resources usage.

SRM accomplishes all this through three submodules – a workload manager, resource use routines and a system controller – plus a lot of input from the user.

Workload Manager

The workload manager controls the relative rate at which processing resources are provided to individual jobs. The rates are established as part of what is called the Installation Performance Specifications (IPS).

With IPS, the user specifies the amount of performance any particular job will receive under any workload condition. SRM is responsible for keeping track of the job's progress and controlling the rate at which resources are allocated. IPS specifications include:

- Performance groups – jobs that should be managed in distinguishable ways.
- Performance objectives – distinct rates, called service rates, at which CPU, I/O and real storage resources are provided to jobs in a performance group at a certain workload level in the system.

Service rate is the number of service units per second a user should receive; a service unit is a measure of processing resources.

Service units are the measure of the amount of processing resources provided and are computed as a combination of the three basic processing resources:

- CPU execution, where one unit is the execution of 10,000 instructions.
- I/O measure, i.e., the amount of input/output units accumulated.
- Real storage occupancy, i.e., one page occupied for some multiple of CPU execution units.

The user can supply coefficients by which to multiply each of these factors, as illustrated by A, B and C in the following formula: Service units = A (CPU) + B (I/O) + C (frames).

Although the performance objectives are only concerned with service rates and not the use of any particular resource, the user can emphasize the relative importance of a resource by weighting it in service-unit formula. For example, if real storage is critical, the user can increase the value of C in the service formula.

Performance Groups

To ensure that jobs with similar processing requirements are serviced uniformly, SRM requires that such jobs be divided into performance groups or job classes. Each such group includes both batch and time-shared jobs.

Under SRM, users may specify the rate of service a job will receive to meet performance objectives; the system guarantees that the rate will be met as the workload characteristics change.

This user specification is called a performance objective. Since the processing loads vary over time, users may employ performance objectives to specify the varying service relationships between groups of users. This way, performance groups deemed high priority will be assured of the necessary service to finish on time.

While on the surface such servicing might discriminate against jobs in lower performance groups, it does not. The workload manager constantly reviews the processing mix and can take necessary steps to ensure that low priority jobs get reasonable service.

The resource-use routines consist of a set of algorithms that make scheduling recommendations intended to optimize the utilization of system CPU, I/O, main storage and paging resources.

The CPU load adjustment algorithm continuously monitors CPU utilization. When this value either goes above or below an acceptable user-determined range, the load-adjustment algorithm recommends swapping of one or more heavy CPU-consuming jobs into main storage in the case of CPU underload, or out if the CPU is overloaded.

The I/O load-balancing algorithm attempts to maintain a dispatchable job mix that will evenly use the logical channels. The algorithm monitors the fraction of I/O requests delayed on each logical channel and ascertains whether this measure of load fails within an acceptable range.

When an imbalance – either an overload or underload situation – occurs, the algorithm seeks out a job known to be a heavy user of the imbalanced resource and may then recommend a swap.

The main storage occupancy algorithm attempts to ensure that main storage is

(Continued on Page 22)

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SRM: Users' Best Tool or Knife to Cut Their Throats?

(Continued from Page 21)

not overutilized or underutilized. It does so by constantly monitoring the number of working sets (groups of currently used application pages) to ensure that they neither waste available storage nor overload it. When the storage is overloaded, a heavy user is swapped out to make more free frames available to other users.

To prevent this corrective action from occurring too frequently and thus adversely affecting overall processing, the main storage occupancy algorithm evaluates the consequences of all anticipated swaps in an attempt to keep the number of free page frames (available page frame count) near a target which is above the minimum level (low threshold).

The page replacement algorithm scans a job's working set and removes those pages not referenced. This is quite a departure from the page-stealing actions of Release 1, which employs system-wide page stealing from all jobs. Some users feel that this indiscriminate stealing of pages contributed heavily to the well-known thrashing problem that has plagued VS.

By stealing from a job or group that have ineffective working sets, IBM claimed excessive paging should be reduced. Whether this is true remains to be seen.

The resource use routines also contain three other algorithms which are designed to ensure efficient use of system resources. These are the device allocation, automatic priority group and ENQ/DEQ algorithms.

The device allocation algorithm keeps track of which storage devices are attached to which channels and attempts to assign data sets to the most lightly used channels. In assigning data sets, the algorithm attempts to keep them on the same logical channel, but not necessarily on the same physical device.

The automatic priority group algorithm dispatches jobs based on the degree on which they are I/O-bound. Heavily I/O-bound jobs are given higher dispatching priorities over CPU-bound jobs.

The ENQ/DEQ algorithm determines whether a job holding a resource is delaying other jobs requiring that resource. The job holding the resource may be running or may be unqueued awaiting CPU service.

In either case, the algorithm makes the job nonswappable, thus assuring that it will receive the necessary CPU time to permit it to complete and release the resource.

Processing Under SRM

The system controller – or control function – monitors the activities of the workload manager and system use algorithms to settle any conflicts that might arise from the recommended action suggested by each.

You see, processing under SRM amounts to a vote by committee, with the committee members being the various algorithms. As in all committees, the members are charged with gathering information and presenting it to a chairman for action.

The SRM chairman is the system controller. Each committee member has its own special interests, and each will try to influence the chairman if a conflict occurs. The workload management algorithm, for example, wants to ensure that jobs receive resources and service as needed to satisfy the IPS. The resource-use algorithm monitors wants to ensure that no shortages or bottlenecks occur.

As you can imagine, the wants and needs of the various committee members can often be in conflict. Such conflicts are decided by the system controller.

The committee takes votes at full-analysis and partial-analysis meetings. A full analysis is called by the chairman (system controller) at predetermined intervals; here all members are ordered to examine their internal queues and assign processing weights to each job.

The weight is determined in light of the job's current status. If a job is causing a bottleneck by tying up a critical resource, the resource-use algorithm will rate it low.

At the full analysis meeting, job weights are added algebraically. If they beat the resource factor coefficients as assigned by the user, they become candidates for new or continued servicing.

The partial analysis meeting is usually called by a committee member when it senses that the jobs under its control are becoming critical. Such a meeting can occur at any time, and the voting process is the same as during the full analysis.

Aside from the weights assigned, there is another factor that influences whether and how a job is serviced, namely, how long a delayed job that is holding a needed resource will be permitted to wait. Supervision on these jobs is performed by the ENQ/DEQ algorithm.

As part of the IPS weighting procedure, a delay value is assigned to each job. When this value is reached, the ENQ/DEQ algorithm informs the committee that his job must be force scheduled.

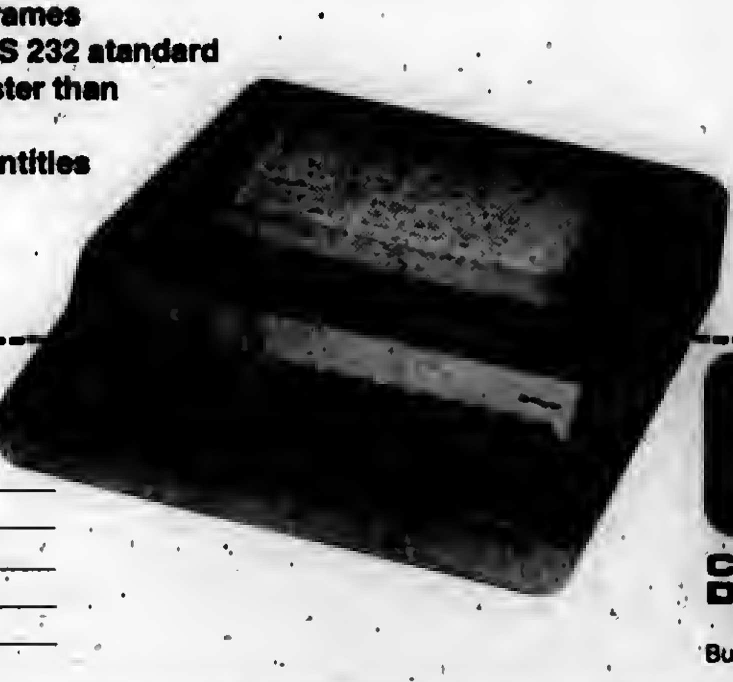
The system then gives the job a long CPU shot in hopes that it will finish and release the resource. (The size of the CPU shot is based on a statistical prediction that a certain class of job can finish processing in a given time.) If not, the job is swapped out and the resource is released.

Overall Benefits

If SRM works according to specs, IBM critics will be hard-pressed to find somthing to complain about – as far as processing efficiency is concerned. The system seems to have solved all the main shortcomings associated with VS, while provided users with a degree of job-processing control.

An in-depth analysis of all the new facilities offered by OS/VS2 Release 2 is available for $25 from Auerbach Publishers, 6560 N. Park Drive, Pennsauken, N.J. 08109.

Hunter is the project editor for Software Reports *prepared by Auerbach.*



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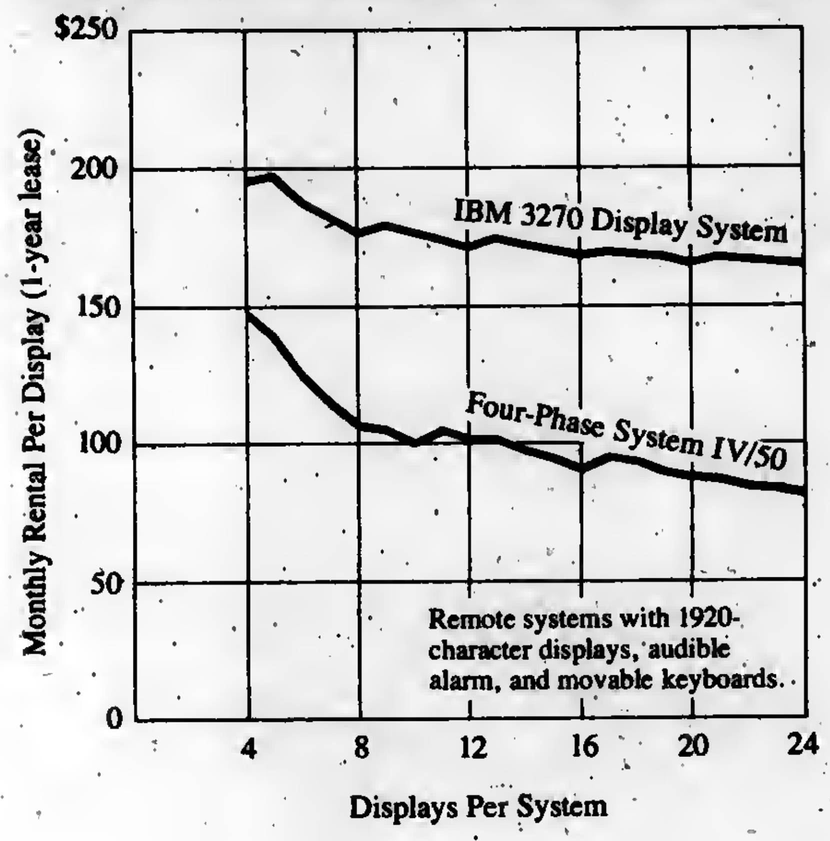

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'Page8' Backs PDP-8 Macros

RIVER FOREST, Ill. – Page8 from Dewar Information Systems Corp. (Disc) is an automatic paging macroassembler that runs under the OS/8 environment on Digital Equipment Corp. PDP-8s.

The language processor permits use of full address arithmetic and automatically adjusts offset references when required, the vendor said.

The macro facility incorporates backward and forward assembly branches, nesting of instructions, symbolic concatenation or linking, defaulted arguments and character string processing. In addition, support for external symbol directories, annotated cross-reference lists and "total syntactic error detection" ease the programmers' chores, according to a spokesman.

A perpetual license for Page8 is available for $580, Disc added from 622 Forest Ave., River Forest, Ill. 60305.

'Minidump' Update Eases Debugging

ARLINGTON, Va. – Another version of Minidump has been announced by Data Services Corp. of America (DSCA). Minidump is an intelligent program dump routine first introduced in the fall of 1974 as an alternative to IBM's Sysabend and Sysudump.

Minidump executes significantly faster and produces far less output than the IBM products, DSCA claimed. Whereas Sysudump, the smaller of the IBM dumps, typically produces some 80 to 200 pages, "Minidump may generate less than 10," the independent vendor said.

Enhancements in the updated Minidump are said to include the display of the main module areas including Cobol working storage and data control blocks (DCB) and the display of user subpools in their entirety to ensure printing of I/O buffers and work areas.

Parameters Shown

In addition, the package supports elimination of some redundant information, display of areas containing parameters passed to a subprogram as well as to the main program and production of subtask dumps even if the main program does not Abend, DSCS said.

When installed, Minidump in effect becomes part of the operating system. It can be used with any IBM OS or OS/VS system, but is not available for DOS, the vendor said.

Minidump for OS-based shops costs $1,520; VS compatibility adds another $460 to the package price.

DSCA is at 1515 Wilson Blvd., Arlington, Va. 22209.

Relocatable DOS Modules Eyed by 'Dossier's' CPA

PORTLAND, Ore. – A documentation and standards package for IBM DOS and DOS/VS installations, Dossier has been extended by Computer Concepts, Inc. (CCI) to examine relocatable libraries as well as core-image libraries as sources of information about program usage.

The Called Program Analysis (CPA) facility compares relocatable libraries with core-image libraries to determine which CALLed routines are included in production jobstreams. CPA generates five reports covering aspects of relocatable library usage and management, CCI said.

CPA's most apparent use, according to the vendor, will be in identifying programs that must be changed or relinked to accommodate changes to CALLed programs. Essential linkedit information for all production programs is consolidated in one of the reports, the spokesman added.

Another report shows all duplications of modules on the relocatable library. These are usually obsolete test versions which, along with unused modules – revealed in another CPA report – can be deleted from the library, CCI explained.

Dossier, including CPA, costs $75/mo on a one-year license. The package is available now from CCI at 6443 S.W. Beaverton Highway, Portland, Ore. 97221.

DP Self-Study Course Available From NCR

DAYTON, Ohio – An NCR self-study course covering fundamental DP concepts and terminology includes a monitor guide, student text and flowcharting supplement.

The student-text portion includes 11 lessons and can be completed in from 30 to 35 hours, NCR said.

The course, which costs $50, can be ordered through NCR Corporate Education Distribution Services, Dayton, Ohio 45479.

Weld Stresses Mapped by UCS

KANSAS CITY, Mo. – Werco, an engineering program recently added to the United Computing Systems (UCS) library, is designed to compute stresses in vessel or tank shells at nozzle or clip connections.

It requires only the basic weldment to obtain a solution, according to UCS.

The resulting stress magnitudes are performed in accordance with the methods defined in the Welding Research Council Bulletin No. 107 entitled "Local Stresses in Spherical and Cylindrical Shells Due to External Loading," UCS said.

The program's output prints stresses relating to the axis system used for the input. Origins and classifications of the stresses computed are also defined.

The program was developed by AAA Technology and Specialties and is offered by UCS on its Uninet communications system which serves over 100 cities across the U.S. and Canada.

UCS is at 2525 Washington, Kansas City, Mo. 64108.

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Structured Design by Edward Yourdon and Larry L. Constantine has already been acclaimed by preliminary reviews as *the* definitive work on such design concepts as structure charts, coupling, cohesion, transform analysis, transaction analysis, communication of data in modular systems, packaging of modules, and implementation strategies for modular systems. This easy-to-read text, with over 600 pages and countless examples, thoroughly discusses design techniques that have heretofore been glossed over in the literature.

Learning to Program in Structured COBOL by Ed Yourdon, Chris Gane and Trish Sarson is intended for people who want to learn to program in COBOL. No previous knowledge of computers is needed. The book deals with the implementation of basic structures in COBOL, using an appropriate subset of the language. Logic structures, nested IFs, and decision tables are dealt with in detail; creation and maintenance of tape and disk files are covered, and the use of structured design is taught in sufficient depth to enable the reader to design, code and test a simple accounting system,

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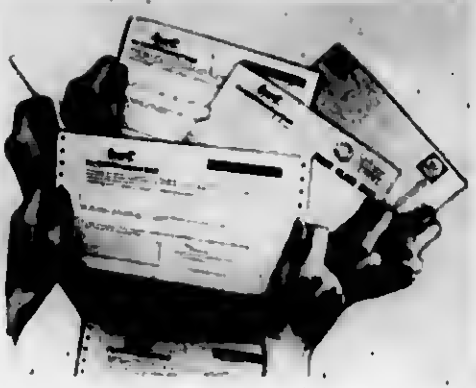

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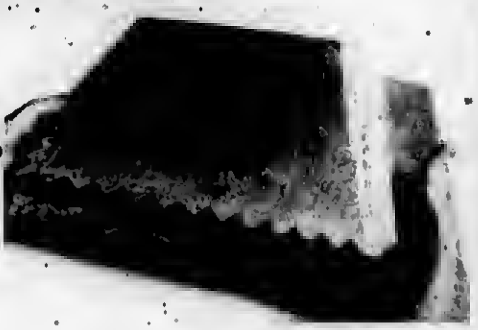

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Will Handle 6.3M Bit/Sec, FCC Told

SBS Plans Full Range of Services Starting Mid-1979

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Satellite Business Systems (SBS) will begin operations in "mid-1979" with a full range of data services from 600 bit/sec up to 6.3M bit/sec.

Transmission of data on the SBS satellite network "will be transparent to character code, message content and line protocol," according to tentative operating data filed with the Federal Communications Commission (FCC).

The information was presented to the FCC as part of the SBS application for an operational system (known as a Section 214) and in response to questions sent to SBS by the FCC's Common Carrier Bureau.

Data service will be provided at 600-, 1,200-, 2,400-, 4,800- and 9,600 bit/sec; 19.2 kbit/sec; and 56 kbit/sec in addition to higher speeds. Standard voice-grade modem interfaces as well as RS-232 and CCITT interfaces will be used, the application said.

SBS will monitor the status of "all major system elements" by means of a System Management Facility (SMF). Consoles will be installed at customer locations to provide the network user "with utilization and status data on his network," the FCC was told.

These consoles will be connected to the SMF via the satellite to enable the user to access that portion of the SMF data base which pertains to his network, SBS said.

SBS users will pay a monthly rate for network service based on a minimum service period, according to the application. The total network charge will be based on the amount of satellite capacity dedicated to the user's network, number of earth stations, number of earth station access ports and terrestrial connecting links.

Separate charges will be set for "on-demand access" to a pool of additional capacity service, SBS said. Rates to be charged for satellite services will be filed at a later date, it added.

Unattended Earth Stations

Unattended earth stations at user premises will be used "wherever practical" and these will contain radio frequency, burst modem and satellite communications controller equipment, SBS told the FCC.

The exact number and location of these earth stations will be determined by user requirements, but "several hundred" small earth stations will be installed during the lifetime of the initial system, SBS said.

An average unattended earth station will include 51 voice ports, seven low-speed data ports and two medium-speed data ports. One high-speed data port will be available for every three earth stations.

SBS will interconnect with the facilities of other common carriers where such an approach is cost-effective, it said. If the user provides his own terrestrial connecting facilities, SBS will connect its access ports to the user's terminal panel.

SBS will also "consider the use of SBS-owned microwave radio, coaxial cable and wire pairs" for the required terrestrial facilities.

Service will be provided to the 48 contiguous states exclusive of Alaska and Hawaii.

As part of a preoperational program, SBS will operate two earth stations at Los Gatos, Calif., and Poughkeepsie, N.Y., for internal satellite development work to be conducted by IBM. The modulation and access equipment at these sites will be owned by IBM.

These facilities will not be used "to reduce any of the facilities and service" which IBM now receives from other common carriers, SBS said.

SBS is a subsidiary of IBM, Aetna Casualty & Life and Comsat General.

Univac Initiates Terminal Family With Introduction of Three Units

By John P. Hebert
Of the CW Staff

BLUE BELL, Pa. – Univac has introduced two microprocessor-based intelligent terminal systems for general-purpose and remote batch applications and a third for text-editing printing and publishing applications.

The communications-oriented Universal Terminal System (UTS), designated the UTS 400 and UTS 700, are said to be able to take on many DP functions usually performed by a central computer.

The UTS 400 can operate as an intelligent remote terminal station or as a cluster of stations, Univac said.

It is a follow-on system to current Univac display terminals and is compatible with the Uniscope 100 and 200 communications procedures, the company added.

The UTS 400 reportedly can be operated over leased, voice-grade or private lines.

As a remote station, the UTS 400 can provide single-station capability with the option of attaching two additional slave stations.

In a large cluster arrangement, the terminal controller interfaces up to six slave stations to a single modem or multiplexer, Univac said.

In addition, the terminal can control peripherals including impact and non-impact printers, tape cassette units and diskettes, Univac claimed.

The terminal can be ordered in four CRT screen formats: 12 lines with 80 char./line, 16 lines with 64 char./line, 24 lines with 80 char./line and 24 lines with 64 char./line.

Eight Character Sets

Besides a U.S. character set, sets are available for use in the Spanish, Danish/Norwegian, Swedish, French, German and Katakana languages, according to Univac.

A set designed for UK use is also offered, it noted.

Acting as a general-purpose computer, the microprocessor controls operation of the terminal by executing the nondestructible programmed logic.

Maximum size of the storage is 36K bytes in a combination of read-only memory (ROM) and random-access memory (RAM), the company said.

The terminal system can reportedly transmit data either synchronously at speeds up to 9,600 bit/sec or asynchronously at speeds up to 2,400 bit/sec in Ascii code, Univac said.

A buffering system is optionally available to permit peripheral device activity to be overlapped with display operations, which enhances local use of peripherals,

The UTS 400 is equipped with parity generation and checking, automatic power-on confidence test, error logging and line monitoring.

The micro-based UTS 400 from Univac can control the Communications Output Printer, the Model 800 printer, the Model 610 tape cassette and other peripherals.

Peripherals available for operation under the control of the UTS 400 include the Univac Model 800 thermal printer with 300 char./sec operation; the Communications Output Printer with a 30 char./sec print speed; the Model 610 tape cassette with a storage capacity up to 1.44M bytes; the 8406 diskette subsystem with 256K bytes of RAM; and the Terminal Multiplexer, the company said.

The Terminal Multiplexer allows UTS 400 masters or terminal controllers to be connected into a data communications system at one system interface point; up to 16 masters or terminal controllers can be connected to a single modem, allowing a maximum of 96 terminals on one communication line, Univac said.

A master UTS 400 can accommodate up to two slave units for a total of three displays plus peripherals.

A controller can handle up to six slaves, plus peripherals, the vendor noted.

The UTS 700 operates both as a batch terminal system or as a remote batch terminal, Univac said.

As a batch system, it features concurrent remote batch emulation and batch operation, disk file management, system control language and error logging, according to the firm.

The UTS 700 sends data and job streams to a distant batch computing system for processing and receives output from the central site, it added.

An RPG-II compiler available with the system allows the user to write freestanding programs, a company spokesman said. Emulators are provided which permit the

(Continued on Page 32)

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Works On-Line and Off-Line

Intertel Control System Tests Distributed Data Nets

BURLINGTON, Mass. – Intertel Corp. has introduced a control system designed to accomplish on- and off-line diagnostic testing in large distributed data communications networks.

The NCS4000 combines network-level diagnostic testing with special commands that switch in spare modems or dial backup network lines when a malfunction interrupts data traffic, the company said.

The system reportedly tests parts of the network while the network is operating, unhindered by remote processors, multiplexers and concentrators; it can be used in point-to-point or multipoint networks.

The diagnostic system passes test signals around hub sites so in-depth tests can be carried out on-line on transmission lines, remote modems and terminals anywhere in the network, Intertel said.

The network control system includes the NCC 401 test diagnostics console and cabinet at a network's central site and Intetel MCS 1200, 2400, 4800 or 9600 modems at the remote sites, a spokesman said.

Intertel modems must be used at remote sites because of their different modulation scheme and the different intelligent electronics within the modems' printed circuit cards, he said. The modems can be used individually or in mixed combinations, he added.

The NCS4000 hardware and diagnostics are said to be transparent to the network's program and host computer and do not disrupt data transmission while testing parts of the network, Intertel said.

The system was designed to be run by regular computer room personnel. After a test has been run on the system, results are displayed on LED displays in English phrases on the control panel of the unit, the vendor noted.

A system operator at the central site runs all diagnostics and restoral functions without operator intervention at remote sites, it explained.

The NCS4000 reportedly works with any network configuration operating at transmission speeds from 1,200- to 9,600 bit/sec.

The system handles 10 primary high-speed lines and up to 400 secondary lines with transmission rates of 2,300 bit/sec – or up to an effective capacity of 4,000 lines, a spokesman added.

Applications of the NCS4000 include troubleshooting to identify problems correctly before calling for service and remedial action, in which the user can spot a problem and take corrective action independently with available "spare" lines, modems or terminals through commands initiated at the central site on the NCC 401 console, the company said.

On-Line Tests

Among the on-line tests which can be performed through the system are on-line automatic sequence testing of network equipment (except for modems), line continuity and level tests, terminal disabled and power monitoring, modem test and lead select test, Intertel said.

Off-line testing of the network includes tests of local and line loops, transmit quality, transmit/receive quality, tests of modems and the display capability of the NCS4000 by inserting transmit errors and receive errors and a block length test, it added.

The NCS4000 also accomplishes special test functions initiated and executed at the remote site without operator intervention. Special functions run on-line while the network is operating, according to Intertel.

The price of an NCS4000 depends on the size of the communications network. A total system, including the NCC 401 and Intertel modems, sells for approximately $50,000 to $100,000, the company spokesman said.

The network control system can be installed in a few hours in any network without disturbing hardware configurations or programming, Intertel said from 6 Vine Brook Park, Burlington, Mass. 01803.

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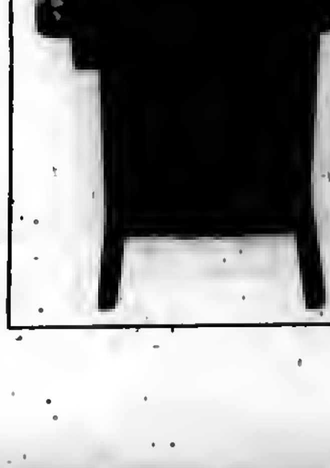

The Teletype® model 33 is the standard of the industry because it delivers outstanding economy, reliability and versatility in a wide range of applications. From message communications to computer input/output. On switched network as well as private-line systems.

For more information about the model 33, write or call: Teletype Corporation, Dept. 32A, 5555 Touhy Ave., Skokie, Ill. 60076. Phone 312/982-2000.

TELETYPE

Teletype is a trademark and service mark registered in the United States Patent and Trademark Office.

Northeast Electronics Has Portable Test Set

CONCORD, N.H. – A portable transmission test set has been introduced by Northeast Electronics.

The Model TTS 44 measures level, noise and frequency; features a large digital readout and can withstand rugged use, according to the firm.

The unit operates for up to seven hours on rechargeable gel cell batteries or from 115 or 230 Vac.

The TTS 44 has dual send/receive channels with single-switch control to simplify testing to loop-around and Code 104 equipment, the vendor said.

With a wideband frequency range of 35 Hz to 60 kHz, the set can reportedly handle the transmission test requirements of nearly all telecommunications circuits in common use including voice, program and data circuits to 50 kbit/sec.

The Model TTS 44 costs $1,750 from Northesat Electronics at Airport Road, Concord, N.H. 03301.

Prentice Synchronous Modem Handles 2,400 Bit/Sec Data

PALO ALTO, Calif. – Prentice Electronics Corp. has brought out the P-201B/C, a full-duplex or half-duplex 2,400 bit/sec synchronous modem.

The unit permits data transmission over common carrier leased lines, private lines or telephone company Direct Distance Dial (DDD) networks as prescribed by appropriate tariffs and regulations, the company said.

The P201B/C is said to operate in the same system configuration as Bell System WE 201B/C data sets.

The unit comes with a standard RS-232C interface, all Bell 201B/C options are standard or strap-selectable, according to the vendor.

Prices for the P201B/C start at $995 from the firm at 795 San Antonio Road, Palo Alto, Calif. 94303.

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LARGE COMPUTER GROUP

Three Models Initiate Univac Intelligent Terminal Line

(Continued from Page 29)

UTS 700 to communicate with a host as if it were the emulated terminal, he added.

The disk operating system functions as a large utility program. RPG-II application programs communicate with the operating system whenever I/O operations are required – for job initiation and termination, file management and control and for general resource management through standard interfaces.

Accommodating private as well as dial-up lines, the system supports card readers, punches, line printers, diskettes and disk cartridges.

It is said to emulate Univac 9200/9300 (RM1) and 1004 systems, the Univac DCT 1000 and 2000 Ascii and IBM 2780/3780 terminal systems.

Three Connection Forms

The architecture of the UTS 700 consists of the processor, main storage and I/O options and is configured around a system bus which transmits data at 1M byte/sec.

Connections to I/O devices are of three forms: direct memory access (DMA) for mass storage devices, shared DMA to allow multiplexing of printers or workstations and communications line adapters (CLA), Univac said.

The processor, with 65K directly addressable memory, is a bit-parallel binary device with an 8-bit accumulator, six 8-bit programmable work/index registers, four condition flags and an 8-bit external data path, it said.

Two speeds of card readers – 300- and 600 card/min – and a reader/punch are offered with the UTS 700.

Two printers with various fonts and character sets are also available: a 600- and a 300 line/min printer, the company said.

The UTS 700 offers a range of disk subsystems from 1M byte of diskette through 40M bytes of cartridge disk, it said.

The UTS 400 Text Editor is a special-purpose model of the UTS 400. Microprocessor programs for text manipulation are contained in ROM, incorporated in the text editor, Univac said.

Additional RAM accommodates text data storage, text management key control, the host command adverb area, the character string manipulation format area and the transmission buffer area, according to the vendor.

The RAM is expandable in 8K-byte increments to a maximum of 16K, representing a total of 229 lines of resident text, it said.

Three screen presentations are offered with the UTS 400 Text Editor – full screen of 23 90-character lines; split-screen of two independent sets of text (23-line, 39 char./sec); and a format mode with 10 lines of 80 characters for string-format text manipulation, the company said.

Scrolling to the beginning or end of the 229 possible lines of resident text is a Text Editor feature. In the split-screen mode, either set of text can be scrolled independently, it added.

The UTS 400 Text Editor includes a 125-character alphanumeric keyboard, the Univac spokesman said.

System Prices

The cost of a UTS 400 terminal system ranges from $9,000 for a one-station configuration to $30,000 for a six-station configuration.

The prices include microprocessor and memory expandable in 8K increments to 24K bytes; communications; device I/O; CRT keyboard for each station; and all software, the spokesman said.

Rental prices for the same configurations range from $273/mo to $938/mo and include maintenance, Univac said.

A typical UTS 700 system is priced at about $59,000 or $1,709/mo including maintenance, a processor with 65K memory, two diskette drives, a 600 card/min card reader and a CRT workstation, the spokesman said.

The price for the UTS 400 Text Editor is $8,100 or $347/mo including maintenance, according to Univac at P.O. Box 500, Blue Bell, Pa. 19422.

Test Sets Get Word Converter

PROVIDENCE, R.I. – International Data Sciences, Inc. (IDS) has introduced the Model 25 full-duplex long word converter, designed for installation in any Western Electric 914B or Sierra 1914B data test set.

The Model 25 is a kit consisting of two printed circuit boards and hardware, a control panel, harnessing and a switch-marking overlay.

Installation of the kit adds a complete 2,047 bit test pattern transmitter and receiver, a transmit error capability and a printer output connector, IDS said.

The Model 25 extends the capability of the test set to allow the full-duplex testing necessary to perform loopback tests and two-way end-to-end tests of data transmission links, the firm said.

The unit costs $750 and deliveries are from stock. IDS is at 100 Nashua St., Providence, R.I. 02904.

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We now have over forty network systems in the field, with another fifteen or so being readied for early delivery. Which means that we have more experience—both in length of time and in numbers of systems installed—than all our competitors combined.

In addition to traditional "host-satellite" networks, we have systems in operation that include so-called "ring" networks, "star" networks, and many more. The important thing is that you can link your computers together in any format you want. Provide each computer with whatever peripherals are best suited to your purpose. And leave the rest to MAXNET.

We figure the best way to give you an idea of what MAXNET can do is to give you some examples showing how other people are now using it.

We invite you to study these case histories. More important, we invite you to get in touch with us so you can get a first-hand look at how well they work. Which is a lot more convincing than just listening to us brag about them.

Meanwhile, we have a couple of brochures you should send for.

Our MAXNET brochure deals with computer networking, and how MAXNET makes it all happen.

The other is a thirty-two page booklet that explains in detail exactly what we mean by MODCOMP "TSP." The Total Systems Performance that has made MODCOMP first choice of many of the world's toughest computer buyers.

If you're into computers at all, the TSP brochure is "must" reading. If you're into resource-sharing networks (and if you're not, you soon will be), the MAXNET brochure is equally compulsory.

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System Ties Phones, Recorders to CPU

Doctor's Idea Proves Cure for Test Reporting Delays

By John P. Hebert
Of the CW Staff

FRAMINGHAM, Mass. – Working on the "very real and serious" problem of health care efficiency, a Boston physician conceived the idea of a computer-aided communications system to report laboratory test results.

Since the implementation of the Rapid Telephone Access System (RTAS) in May 1975, at Framingham Union Hospital here, there has been a significant reduction in the time from physician's dictation of test results to first access of patients' lab reports, according to Dr. Gerald M. Kolodny.

In addition, there has also been a "trend toward reduction in patients' length of stay as a result of the system's experimental implementation in the 329-bed teaching hospital affiliated with the Massachusetts General Hospital (MGH), the associate professor at Harvard Medical School and director of the Radiology Research Laboratory at MGH said.

Kolodny's conception of RTAS resulted from his inability to find normal hospital engineering criteria to meet the problem of health care efficiency, he said.

"It was a problem that could only be solved with a computer," he recalled.

After receiving a $165,000 grant from the U.S. Public Health Service for the development, implementation and evaluation of a system to fulfill this need, Kolodny took his problem to Sudbury Systems, Inc., which built and implemented RTAS at Framingham Union.

The challenge he brought to the firm in nearby Sudbury was to design a system that would reduce the length of time in which reports could be accessed by other doctors, Kolodny said, because "you can't ask a physician to wait."

Other challenges the system had to meet were instantaneous access from a variety of locations and the capability of allowing a physician to transmit and record the information in the same way as had always been done, he said.

The RTAS "solved all of these problems" by making doctors' taped reports available from any Touch-Tone telephone immediately after the diagnosing physican enters a patient's report, Kolodny said.

The experimental system is concerned only with the reporting of X-ray examinations, although Kolodny indicated it could be used for all hospital laboratory test reporting.

As each request for a lab test is sent from the patient area to the X-ray department, a "flash card" of patient and physician identification information is typed out by an operator working on a Digital Equipment Corp. LA36 Decwriter II terminal, he said.

As the data is typed on the card, it is also recorded by a DEC PDP-11/05 minicomputer – dedicated to RTAS – with 8K bytes of memory and a cassette for off-line loading.

The requisition is turned over to a staff radiologist who inserts the card onto the corner of the patient's X-ray film cartridge for the particular test.

The physician examines the film and enters the patient's identification number on the keyboard of a dictation machine which has an RS-232-type dedicated interface for in-house communications to the host CPU at a transmission rate of 2,000 bit/sec, a spokesman for Sudbury Systems explained.

Each report is recorded on individual tape recorders called Recorpaks with a tape of five or more minutes capacity.

The computer accessing of reports involves a time-division multiplexing scheme that allows for simultaneous recording and retrieval of patient test reports by up to 16 consulting physicians – the number of drawers holding the Recorpaks.

The computer recognizes the patient code number the radiologist keyed in and searches through the slide-out drawers to find a Recorpak with an empty tape.

When a consulting physician calls into RTAS, he receives a through-dial interface, then a second-level dial tone, according to the Sudbury Systems spokesman.

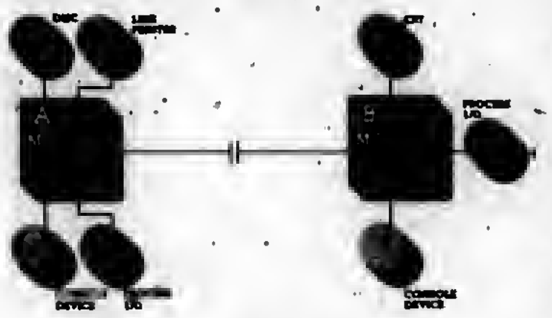
When the patient's code number is entered through the phone's number and symbol pad, the consulting physician can hear the report, he said.

According to an evaluation of RTAS by Kolodny and his colleagues, "a very large proportion (45%) of the reports were accessed within the first five hours of dictation using the RTAS," compared with 3% access within five hours of dictation for a control group:

Case History No. 1
A giant aluminum company chose MODCOMP for this simple two-computer "network."
Computer A is at one of the Company's plants in Pennsylvania. Computer B at a research facility in Tennessee, several hundred miles away. The two computers communicate with each other over ordinary dial-up telephone lines. Using MAXNET, operators at either location have full access to all the resources of both computers. Data, programs, peripheral services can be freely exchanged.

For example, suppose a research engineer at Computer B needs to compile a new program. By a simple terminal request, he can call down language processors from Computer A, compile and edit his program on his own computer, and transmit his listing outputs back to Computer A for printing.

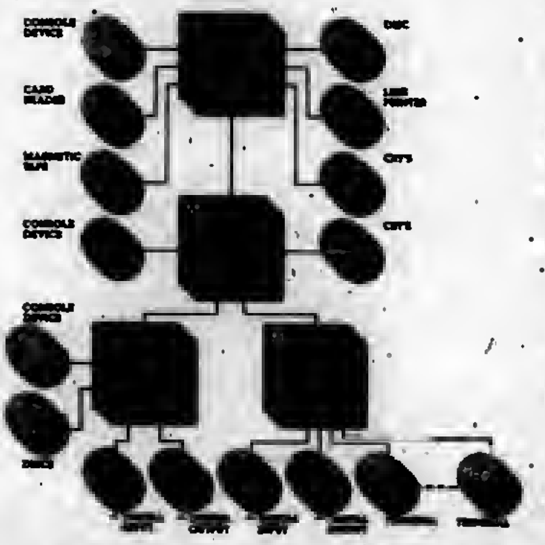
Alternatively, a programmer at Computer A can prepare a program and load it directly down to Computer B. Even though it's the break of day in Tennessee, and the computer is all alone in the office.



This relatively simple system illustrates the flexibility of MAXNET, whether the computers in your network are in adjoining rooms, or a thousand miles apart. It would work just as well if they were on different planets, but nobody's asked us to do that. Yet.

Case History No. 2
This MODCOMP Network is in operation at the central R&D facility of a major oil company. It's a good example of how MAXNET, coupled with across-the-board compatibility of MODCOMP hardware, allows you to start as small as you want to, and grow as big as you need to. Without a heavy initial investment. And without costly re-programming as your system expands.

It started, as part of a long-range plan, with the installation over two years ago of a MODCOMP III. Although this model has now been superseded in our line by later models of the MODCOMP II, it is indicative of the long-term compatibility of MODCOMP systems that the III remains today a vital part of this network.



As the system has since evolved, a 32-bit MODCOMP IV now acts as host computer. Replacing (at a fraction of the cost) the company's former stand alone IBM 1800, the MODCOMP IV is expected to provide 10 to 25 times the throughput of the big machine, which had long since reached its saturation point.

A MODCOMP II acts as communications controller between the host and satellite computers.

The satellites consist of 16-bit MODCOMP II's performing various data acquisition and control functions for a series of pilot plants. The MODCOMP III handles analytical instrumentation, providing simultaneous service to over 80 instruments of various types.

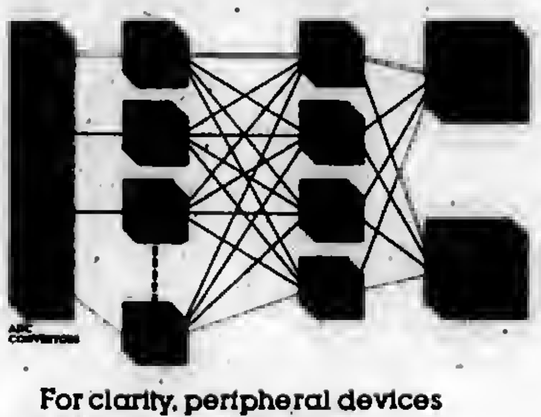
The advantages of this system are, firstly, it's computing power— many times that of the old stand-alone system. It's reliability (the MODCOMP system has had an overall availability of 99.3% of prime time over the past two years). It's expandability, which allows virtually unlimited future growth. And last, but far from least, it's economy and ease of operation.

Case History No. 3
A NASA prime contractor has installed this highly sophisticated MODCOMP hierarchical network to handle complex stress and fatigue test analyses.

Dual redundant 32-bit MODCOMP IV's at the "host" level communicate with an intermediate level of several smaller 32-bit MODCOMP IV's, screening data received from the satellite computers. A large number of 16-bit MODCOMP II satellites interface directly to the various processes. The entire system has built-in redundancy at each level.

Among minicomputer vendors, only MODCOMP has the capability to build a network of this size and complexity, using standard hardware and software products. At a small fraction of the cost for a single stand-alone computer large enough to perform the same multiple tasks. And with far greater efficiency.

It clearly illustrates the unlimited expandability of MAXNET in setting up any kind of network system you need to do your particular job.



For clarity, peripheral devices omitted from this diagram.

Note: The MAXNET systems shown here are all resource-sharing networks of the type commonly used in laboratory and industrial measurement and control systems. For dedicated telecommunications applications, MODCOMP offers a separate software system called MAXCOM. For more information, send for our Data Communications *brochure.*

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Also Adds Monitor/Tester

ARC Unveils Data-Patch Control System

ALEXANDRIA, Va. – Atlantic Research Corp. (ARC) has added a communications control system, Data-Patch, to its NCS-100 network control system product line and introduced a programmable communications monitor and interactive tester.

Data-Patch is a modular digital patch system that is said to allow the network controller to access data circuits at the EIA RS-232 or CCITT V.24 interface by 24-conductor patching.

The device can be used to connect modems, multiplexers, terminals and computers where rapid service restoral or diagnostic testing is required, ARC said.

When using the monitor access patch position, test equipment can be inserted without interrupting the circuit, according to the company.

A typical system consists of a rack-mounted assembly equipped with 16 Data-Patch modules and an adapter module; the system can be expanded by adding modules on a per-circuit basis, ARC said.

Each module has three patch positions: computer, modem and monitor. When no patch cords are inserted, the circuit between the modem and computer is "normal through," the company said.

The Intershake II communications monitor/tester reportedly provides the capability to handle all codes and line disciplines at speeds up to 64 kbit/sec with internal clock and up to 256 kbit/sec with external clock.

In addition, the device provides for all aspects of half- and full-duplex testing, including display and block check character calculation for transmit and receive data of binary synchronous, IBM Synchronous Data Link Control and other protocols, ARC said.

Routines may be structured manually from a library of 100 programmable test steps including jump and branch and loop instructions for software-like test programming, it added.

Intershake II offers a choice of one or two synchronous characters and an auxiliary parallel interface for autodialers, data acquisition printers, CRT displays, bulk storage cassettes and keyboards, according to the firm.

Simultaneous display of the full-duplex data stream is provided with the CRT option, ARC noted.

The Intershake II test step instructions are implemented from a permanent read-only memory of eight stored tests of up to 128 steps each; from a nonvolatile memory manually programmable by the user; or with manual edit of both types of memories to permit test variation, the company said.

A standard Intershake II costs $9,490, with delivery in 90 days; the Data-Patch system costs $1,200; the company said from 5390 Cherokee Ave., Alexandria, Va. 22314.

TDX System Reduces Monthly Phone Bills

McLEAN, Va. – TDX Systems, Inc. has introduced a management control system which it said can reduce by up to 40% the monthly phone bills of large-scale users of long-distance telephone and Wats lines.

The computerized Telecommunications Management and Control System (TMCS) is primarily oriented toward voice communications because of normal waiting periods on voice communications lines, according to a company spokesman. To accomplish data communications traffic, extensive software modifications might be necessary, he added.

TMCS is based on distributed networks of Intel 8080 microprocessor-driven circuit switches at user sites. The switches are connected through a data circuit to two 1M-byte Interdata 7/32 CPUs located at TDX headquarters here.

TMCS chooses the least-cost facility to accomplish a call and tracks all outgoing long-distance calls, including the person who placed the call, TDX said.

The system is not oriented toward terminal applications, but is transparent to terminal operations, the spokesman added.

The system is expandable in modules of eight ports; for an eight-port configuration, the cost is $30,000 or $1,000/mo including maintenance, the spokesman said from 7670 Old Springhouse Road, McLean, Va. 22101.

ISI Has Addressable Modem For TDM Communications

ANN ARBOR, Mich. – Interactive Systems, Inc. (ISI) has introduced a single-address intelligent modem for full-duplex coaxial cable digital communications systems using time-division multiplexing (TDM) techniques.

The Model 810, an 8-bit parallel, CMOS logic data modem, was designed to interface a single parallel digital device such as a CRT, line printer or teletypewriter to an ISI coaxial cable communications system at transmission rates up to 48 kbit/sec in full-duplex mode.

The model 810 is priced at $600, an ISI spokesman said from 3980 Varsity Drive, Ann Arbor, Mich. 48104.

Interface Works With PDP-8s

WELLESLEY HILLS, Mass. – Standard Information Systems, Inc. has introduced an asynchronous communications line interface for Digital Equipment Corp. PDP-8 minicomputers.

The asynchronous line interface (AL1) features programmable multiple speed capacity for up to 64 lines and is a cost-effective alternative for users of more than eight lines, the company said.

The user can select eight transmission speeds from a total of 15 speeds of 50- to 9,600 bit/sec. These eight speeds operate under an automatic transmission speed recognition capability which is wired in under program control, a spokesman said.

In addition to line speed, character length, internal loopback, echo control and a transmission break generation/detector are standard features which also operate under the program control of the PDP-8, he said.

The AL1 is compatible with either the PDP-8 omnibus or the older external bus, according to the company.

The price for a basic eight-line interface is $5,800 without modem control and includes spare parts, a power supply, interface cards and repair service for two years, the spokesman said.

The price for additional lines in increments of eight is $1,200; there is a cost of $1,100/card for modem control in 16-line increments, the spokesman said from 36 Washington St., Wellesley Hills, Mass. 02181.

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Many Approaches Possible

User Selecting Gear Faces Myriad of Alternatives

By Toni Wiseman
Of the CW Staff

DALLAS – Once the decision to acquire a computer has been made, the question becomes "Which specific computer system is needed?" according to Joe Auer, president of International Computer Negotiations.

"Notwithstanding an accurate assessment of processing requirements and a determination of which computer system would fulfill these requirements, a buyer is confronted with an array of mainframe vendors, peripheral manufacturers, brokers, other users, leasing companies, etc., which he can utilize to acquire a total system," Auer said.

Auer was addressing a Computer Caravan workshop here on the subject of equipment and financing alternatives.

In assembling a system "by device," the possible acquisition combinations become factorial by an amount equal to the number of devices and potential supplier sources involved, he said.

Further compounding the acquisition process is the acquisition method which runs the gamut from a rental contract to a purchase through the possibilities of third-party lease, installment purchases, extended leases, rentals with purchase options, etc., he said.

Generally, new components have some advantages since they allow the user to have a state-of-the-art system, take advantage of investment tax credit in certain acquisition methods and rest a little easier with regard to warranties, maintenance contracts and such.

If a company does not necessarily need the investment tax credit on new equipment, it might still want to look at acquiring new gear through a leveraged lease. This allows the leasing people to pass on the tax advantages to their investors, which in turn ends up in a net savings to the user company through a lower lease rate, Auer suggested.

"If the equipment is a new line of gear, do not be afraid to ask for all types of concessions and considerations for being the first in your area to install that particular piece of gear," he said.

"You can get considerations for allowing your company's name to be used in vendor advertising and allowing the computer itself to be used for benchmarks, demonstrations and education."

Depreciated Gear

Depreciated gear, on the other hand, can also offer financial opportunities in both acquisition and ongoing utilization costs, Auer noted. For instance, in some cases a company can buy more computing power for its specific need than through newer state-of-the-art offerings.

"In addition, you don't have to reinvent the wheel on operating and application software which has financial and implementation timing advantages," he said.

In terms of pricing depreciated gear, traditionally a vendor will take a look at the price at which each component of the configuration is listed on their books and compute an average book value, he said.

The internal gross margin requirements will be applied to it, along with a "pad," and this final price can be anywhere from a very low percentage of list up to 90% of list, Auer said.

Don't always consider a manufacturer the only source for depreciated gear, Auer said. There are computer brokers, third-party leasing companies and other users who are getting rid of the type of gear you may want.

One approach to depreciated gear is to mix it with state-of-the-art equipment, since some areas, such as peripherals, are progressing faster than others.

Think in terms of mixing your configuration with depreciated gear for some components that meet your needs and renting components that may be headed toward a change in the state of the art. If you anticipate a change in your needs, you might want to go ahead and rent new gear in those areas," he said.

Acquisition Methods

The vendor rental contract offers absolute maximum flexibility to anybody acquiring a computer. This is in part because of the relative ease of upgrading and downgrading the system into the user's changing requirements.

Also, the user has the ability to take advantage of state-of-the-art offerings made by the vendor at future dates because normally a vendor will allow a user to go to the vendor's new gear for just a net difference in monthly rental if it's an upgrade.

Other advantages of vendor rental contracts could include shorter term obligation. Some users feel it is beneficial to make monthly payments directly to the manufacturer who then has a vested interest in updating the computer at the user site since he (the vendor) really owns the equipment.

Auer also mentioned disadvantages of vendor rental contracts. They are probably the highest monthly cost way to

(Continued on Page 44)

Centronics Printer Line Includes Teleprinter With 300 Bit/Sec Speed, 60 Char./Sec Units

HUDSON, N.H. – Centronics Data Computer Corp. has introduced a line of printers that includes a 300 bit/sec teleprinter and two 60 char./sec serial impact printers.

The 761 teleprinter is available in receive-only (RO) and keyboard send/receive (KSR) versions and is designed for use as a CPU console or remote terminal.

Available with serial or parallel microprocessor interfaces, the 761 can print and transmit incrementally when data is entered from the keyboard. It operates in a bidirectional printing mode when receiving data in a remote application.

The unit prints 7 by 7 dot matrix character at 80 char./line and is available with RS-232, CCITT or current loop interfaces.

Options include 132 char./line, higher transmission speeds up to 9,600 bit/sec and a buffer of up to 2,048 characters.

The Model 700 is a 60 char./sec unidirectional printer with a throughput of 13- to 90 line/min. It prints 80 columns at 10 char./in. using a 5 by 7 dot matrix character.

The Model 700 is designed for applications that require "low throughput, hardcopy output," such as CRT printers, offline selective printing for small business systems, etc., the firm said.

The Model 701 is a 60 char./sec bidirectional printer with a throughput of 25- to 120 line/min. The unit incorporates LSI electronics "on one circuit card."

The Model 761 KSR costs $2,025 while the RO version costs $1,895 with first deliveries scheduled for the fourth quarter.

The Model 700 costs $1,520 with first delivery in the third quarter while the Model 701 costs $1,815 with first shipments in the third quarter.

The firm showed "preproduction models," but said delivery schedules would be met. Lease terms and OEM discounts are available. Centronics is on Route 111, Hudson, N.H. 03051.

Macro Products Adds Chain-Type Printer

LONG BEACH, Calif. – Macro Products Corp. has added a fourth chain-type printer to its line.

The M-550 is reportedly plug-compatible with the Honeywell 2000, 6000 and Series 60 mainframes as well as IBM 360/370 and Univac Series 70 CPUs.

Characters move horizontally on the firm's Charaband chain and are printed at a rate of 1,500 line/min.

The M-550's $42,500 price includes installation, the firm said from 3110 E. Willow St., Long Beach, Calif. 90806.

Azurdata Introduces Terminals

RICHLAND, Wash. – Azurdata, Inc. has introduced two portable data entry and collection systems designed for retail applications.

The Infopac models 1 and 1-1/2 terminals feature 4K-character standard memory capacity, Nicard battery pack, keyboard and LED display, a company spokesman said.

The Infopac Model I-1/2 is said to weigh three pounds and offer up to 64K characters of memory.

Information can be entered into the Infopac terminals from the keyboard or with an optical character recognition wand-type reader passed over the standard bar codes, the company said.

Features include variable record length, error prevention controls with audible alarms and fast-dump capability with transmission up to 2K char./sec, it added.

A choice of various transmitters and transmission codes and rates are available.

The cost of a standard Infopac 1 terminal with a companion transmitter is $1,350, Azurdata said from 1305 Mansfield Ave., Richland, Wash. 99352.

Kodak Announces Products For Document Microfilming

ROCHESTER, N.Y. – Several products for high-speed document microfilming have been announced by Eastman Kodak Co.

Recordak camera sorter microfilm SO-354 is available in 16mm format and can be supplied in various lengths and configurations to fit high-speed document microfilmers.

Kodak Scanner-Pack M cartridge and B cartridge are disposable packages offering daylight loading of microfilm.

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Models Predict Salinity

DP Helps U.S. Desalt River Water

DENVER – A Control Data Corp. Cyber 74 computer here at the Bureau of Reclamation's Engineering and Research Center has been put to work easing international tensions between the U.S. and Mexico.

The system is being used to predict, monitor and help control salinity levels of the lower Colorado River.

Excessive salt content in the water reaching Mexico has been the cause of disputes between the two countries for more than a decade.

Salinity increases in the Colorado River have been recorded since the early 1900s. Even before the problem became acute, salinity of the lower Colorado had been steadily increasing.

By 1962, saline concentration was nearly double what it had been only 10 years earlier. By 1970, salt content at the southern end of the Wellton-Mohawk irrigation canal which drains into the Colorado above Mexico's Morelos Dam sometimes reached 3,000 part/million, a level unacceptable for most agricultural purposes.

In August 1973, Mexico and the U.S. signed an agreement to effectively control the salinity of the million and a half acre-feet of water that the U.S. is obligated to deliver to Mexico from the Colorado River under a 1944 treaty.

Under the 1973 agreement, water reaching Mexico must have "an annual average salinity of no more than 115 part/million ± 30 part/million over the annual average salinity of the Colorado River waters which arrive at Imperial Dam."

The requirement became effective with the signing of the Colorado River Basin Salinity Control Act in 1974 (Public Law 93-320). That act authorized the construction of the works necessary to achieve the agreed differential in salinity. As a permanent solution, the method most acceptable to the U.S. for maintaining the differential salinity level of 115 milligrams per liter is to modify the Wellton-Mohawk drainage waters.

This will involve irrigated acreage limitations, improved irrigation efficiencies, further regulation of Gila River floodflows and construction of a large-scale desalting complex to treat the saline drainage waters.

The job of design, construction, operation and maintenance of the world's largest desalting plant has been assigned to the Bureau of Reclamation. The Cyber 74 is used to assist in comprehensive modeling studies to predict future salinity conditions in the Colorado River, the effects of improved irrigation efficiencies on drain water supplied to the desalting plant and future flow conditions in the Colorado River. During plant operation, the computer will provide water quality simulation of the river to help assure that the agreed-upon salinity differential is maintained.

Meanwhile, in another related study, the Bureau of Reclamation is looking into the feasibility of tapping the huge water reservoirs and geothermal power and sources underlying much of California's Imperial Valley as a means of augmenting and further improving water quality in the Colorado River.

Water in this tremendous subterranean reservoir, while often too salty in its natural state as it flows freely from the ground, can be desalted by using heat in the fluid itself. The heat energy can be used to generate electrical power, power desalting plants and return the fresh, usable water to the river.

Computer programs are utilized to determine the size of the reservoir and its expected useful life. These programs are derived from information such as changes in yield of the wells and various geophysical data.

While only on a pilot test scale, the process offers a supplemental means to make additional good-quality water available to users of the lower Colorado River water.

System Monitors Utility's Generators

LOMBARD, Ill. – A computerized dispatch system has been credited with expanding the monitoring and security-analysis capabilities and improving control of electrical generating units for the Commonwealth Edison Co. here.

The system, in use for three years of testing and on-line operation, is installed at Commonwealth Edison's System Power Supply Office.

With the system, the utility achieves:

- Control of generation, minimizing operating swings, matching loads and generation and meeting interconnection requirements.
- Evaluation of planned transmission-line outages, resulting in reduction of work schedules at times of premium labor rates.
- Restoration of line loadings and bus voltages following unplanned outages.
- Acceptance by dispatchers who already have suggested assigning new tasks for the system.

The system has monitoring capabilities which provide for telemetering and information display from more than 70 remote locations and interconnecting tie lines.

It controls 36 electrical generating units ranging in size up to 1100 MW. Technical teams from Commonwealth Edison and Leeds & Northrup (L&N) designed the system over a 3-1/2-year period.

Real-time status processors and an on-line load-flow program provide an accurate analysis of the entire network operation.

Two identical digital computers, each with 48K of core memory, handle all system-control functions. In the dual LN5500 system from Leeds & Northrup, one machine, designated "master," performs all system functions while the other computer, designated "reserve," monitors the master's operations and immediately takes over in case of failure of the master.

If both computers fail, a second-level control backup is provided through a simplified L&N analog broadcast control as further insurance that load-frequency control will be maintained.

Conitel 2100 digital data-acquisition and control equipment serves as telemeter for the control system. Nearly 1,000 analog quantities – megawatts, megavars, kilovolts, weather data – and the status of over 500 circuit breakers are telemetered from the remote stations throughout the Commonwealth Edison system and at neighboring interconnection stations.

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ADVERTISING PAGES 37-40 MISSING.

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Printing speed is 45 cps and even faster when the 1620's backward printing capability is used. A microprocessor and few moving parts mean low cost, trouble-free operation over longer periods. When maintenance is needed, it is available nationwide through Sorbus.

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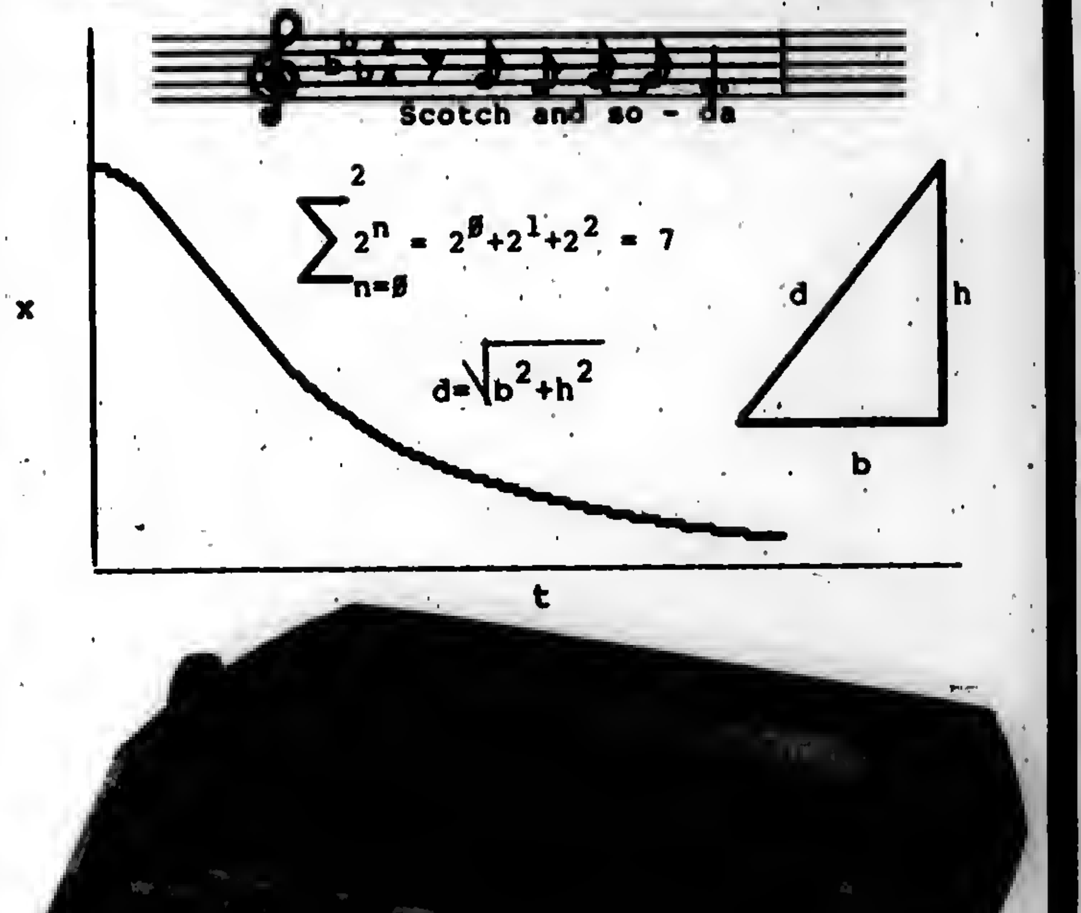

Cost Analysis Worksheet Included

Primer Teaches Tape Management Program Setup

BURLINGTON, Mass. – Some tape-writing problems can be a great expense to an organization; other tape-read failures can "result in hours of catastrophic rerun time lost to a single tape defect."

These are some of the justifications for "Why It Is Cost-Effective to Establish and Implement a Tape Measurement Program" – a four-page primer and do-it-yourself cost analysis worksheet from Computer-Link Corp. here.

The primer includes information about tape errors and costs of tape failure and how both to establish a tape management program and select equipment best suited to implement the program.

Part of the primer is a worksheet designed to evaluate annual costs for tape and information necessary to justify a tape cleaning and evaluation program, Computer-Link said.

Tape errors, according to the booklet, occur when dirt and wear particles caused by normal use build up enough to cause signal dropouts.

Successful Program

A successful tape management program includes capabilities for tape cleaning, evaluation, repair or replacement and tape scheduling, it said.

The identification of actual costs of tape failures involves determining the number of "dead tapes" in a tape library, the unnecessary purchase of new tapes to compensate for the loss of the unusable ones and the cost of read-error failures causing lost hours in processing time, the primer said.

In addition to these things, write errors, resulting from each tape written when a parity failure occurs, must be taken into consideration, it noted.

The booklet includes a chart, based on computer system rental costs, which determines the cost of write-check errors when the computer is in a wait state while the tape unit attempts to write a record on a defined area of tape.

By identifying the areas that produce large money losses caused by tape problems, the items to be controlled can be pinpointed, it stated.

"A small expenditure in equipment and scheduling can establish a tape management program that provides a smoother running, more efficient operation with up to 85% of the lost dollars recovered," according to the primer.

The first step is to start with tapes which cause the biggest problems, it said.

Next, schedule all tapes in the libarary for regular maintenance by using a tape reliability indicator label. Then establish criteria for rejecting, retaining or repairing each tape based on its present performance, it advised.

The primer can be obtained from Computer-Link at 14 Cambridge St., Burlington, Mass. 01803.

CEI Offers IBM Users Technical Training

WASHINGTON, D.C. – IBM-oriented technical training services and motivational development sessions for operations personnel, developed by Computer Education International, Inc. (CEI), can be tailored to a client's DP and organizational needs and presented at the client's site, according to a CEI spokesman.

The technical training is shaped to the user's existing or planned hardware/software configuration and supports "all conventional operations functions," the vendor said.

While the technical training focuses on extending the students' knowledge of systems, flows, functions and processes – to improve their ability to perform on the job – the organizational training is keyed to encouraging self-development, improving attitudes toward the work to be done and strengthening commitment to the organization, he said.

Typical charges range from $60- to $90/student day, including all tailoring, instructional services, materials and CEI staff travel expenses. Clients usually supply classroom facilities and support plus machine time if applicable, the spokesman added.

CEI is at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

Scan-Data Extends OCR Product Line

NORRISTOWN, Pa. – Two extensions to Scan-Data Corp.'s optical character recognition (OCR) product line include a system capable of reading intermixed alphanumeric handprint direct from source documents and the Area Scan feature, which increases the flexibility of forms reading by the company's OCR systems, Scan-Data said.

The OCR system which reads alphanumeric handprint "enables handprint to be used in applications where mixed letters, numbers and symbols are required, such as for model part data, street addresses and motor vehicle information," he added.

The Area Scan feature is an extension of the company's continuous-feed option [CW, Sept. 17].

Area Scan enables the system to read larger sections of a form without paper movement, providing improved flexibility in field-scanning sequence, Scan-Data claimed.

"In addition to helping to increase document throughput, the capabilities of Area Scan make our system more compatible with forms design for IBM 1287 and 1288 OCR systems, facilitating conversion to Scan-Data equipment," the company spokesman said.

A typical Scan-Data 2250/1 OCR system with alphanumeric handprint recognition capability costs between $8,000/mo and $10,000/mo on a two-year lease. A system with the continuous-feed option, which automatically includes Area Scan, would start at a price of $5,000/mo on a three-year lease.

Scan-Data is at 800 East Main St., Norristown, Pa. 19401.

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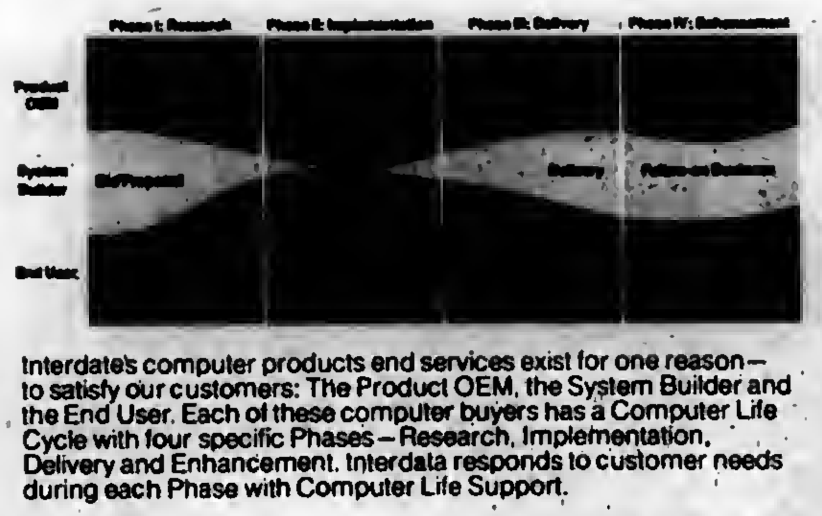

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User Looking for Hardware Has Options

(Continued from Page 35)

acquire a computer; there are no meaningful tax advantages; and the user is subject to indiscriminate price increases by the vendor.

The primary advantage of an outright purchase, on the other hand, is that it is probably the lowest total-cost way to acquire a computer, Auer said, and the user can take advantage of all the tax advantages such as full investment credit and depreciation.

On the minus side, outright purchase requires a high initial outlay of capital and a long-term commitment to a particular vendor and his operating system. In addition, the user may be faced with obsolescence, he said.

In between rental contracts and outright purchase, there are any number of financing vehicles, and each has its advantages and disadvantages, Auer said, mentioning third-party lease, installment purchase, extended lease and purchase options as a few of the possibilities.

Specific advantages and disadvantages of third-party lease are a blend of various pros and cons of an outright purchase or a standard rental agreement, he said.

Some general advantages unique to third-party leasing are that the leveraging aspects can pass on financial savings to the lessee; the lease can be structured to tailor payments with regard to the lessee's cash flow requirements; and the user need not strain existing credit.

Most users should undertake a purchase vs. lease vs. rental analysis on different components of the system, Auer said.

Some users may find it advantageous to purchase selected components outright while placing others on a third-party lease and renting the remainder, he noted.

Once the user has determined to pursue a transaction and has satisfactorily evaluated the acquisition method, he must tailor the transaction to its specific data processing needs and management goals.

"To be effective, this requires that the user develop an interdisciplinary negotiating team, comprised of the firm's data processing manager, legal counsel, comptroller or other financial expert and a member of top management.

"To the extent that such assistance is available, the user may also wish to retain a computer negotiating or consulting firm to contribute to the entire acquisition process," Auer said.

Auer left the attendees with a final caution: "If it's not written into the contract or lease agreement, it's not part of the deal."

Remex Floppy Bows

SANTA ANA, Calif. – A flexible disk drive, the RFD 1000, has been announced by the Remex Division of Ex-Cell-O Corp. featuring double-density capability.

In double density, the RFD 1000 will provide up to 6.4M bits of data storage, the vendor said. Transfer rate is 500 kbit/sec. In addition, the RFD 1000 can be employed for single-density (up to 3.2M bits) data storage with a transfer rate of 250 kbit/sec.

Both format and media are user-selectable. When IBM compatibility is desired, the RFD 1000 will read and write IBM 3740-formatted diskettes, providing 1.9M bits of data on one side of standard media, Remex said. The unit will also accept 32-hole hard-sectored diskettes without alteration to the drive, increasing single-density data capacity to 3.2M bits.

The price is $700 per single unit.

OEM Memory Module Announced by CDC

PALO ALTO, Calif. – The CDC 94550 memory module from Control Data Corp. was introduced at the California Computer Show.

It is the second in a family of semiconductor memory modules developed by the firm for use in the OEM market for small computer systems and communications.

The 94550 module is a dynamic random-access memory that uses 4,096-bit metal oxide semiconductor storage devices to provide a high-density array card of around 1.3 million bits, the firm said. The system is configured to utilize 5-1/4 inches of a standard 19-inch rack mount, it added.

The basic 64K by 20-bit module is used to expand the system to 1,024K bytes with a single timing and control card, CDC claimed.

The memory system has a 450-nsec cycle time and a 325-nsec access time and offers full read, write and partial-write cycles, CDC continued.

Prices and delivery schedules for the memory module have not yet been determined. For further information contact R.C. Urban at CDC, 3857 Louisiana Ave., St. Louis Park, Minn. 55426.

Univac Buffered Keypunch Gets Mark-Read Feature

BLUE BELL, Pa. – Univac is offering a mark-read feature on its Model 1710 Verifying Interpreting Punch (VIP).

This is the first time such a capability has been available on a buffered keypunch, according to the firm.

Either 40 or 80 columns of marked data can be accommodated on an 80-column card. Up to 12 vertical marks per card column can be recorded, Univac said.

Throughput in the mark-read mode is between 40- and 60 card/min, it added.

More Costly Previously

Previously a mark-read function was provided only on more costly units, which also offer character reading, or on separate units which operate on-line or are interfaced to a card punch, paper tape or magnetic tape unit, the firm said.

Rental of the mark-read feature is $110/mo including maintenance. Deliveries are scheduled for August; the firm can be reached through P.O. Box 500, Blue Bell, Pa. 19422.

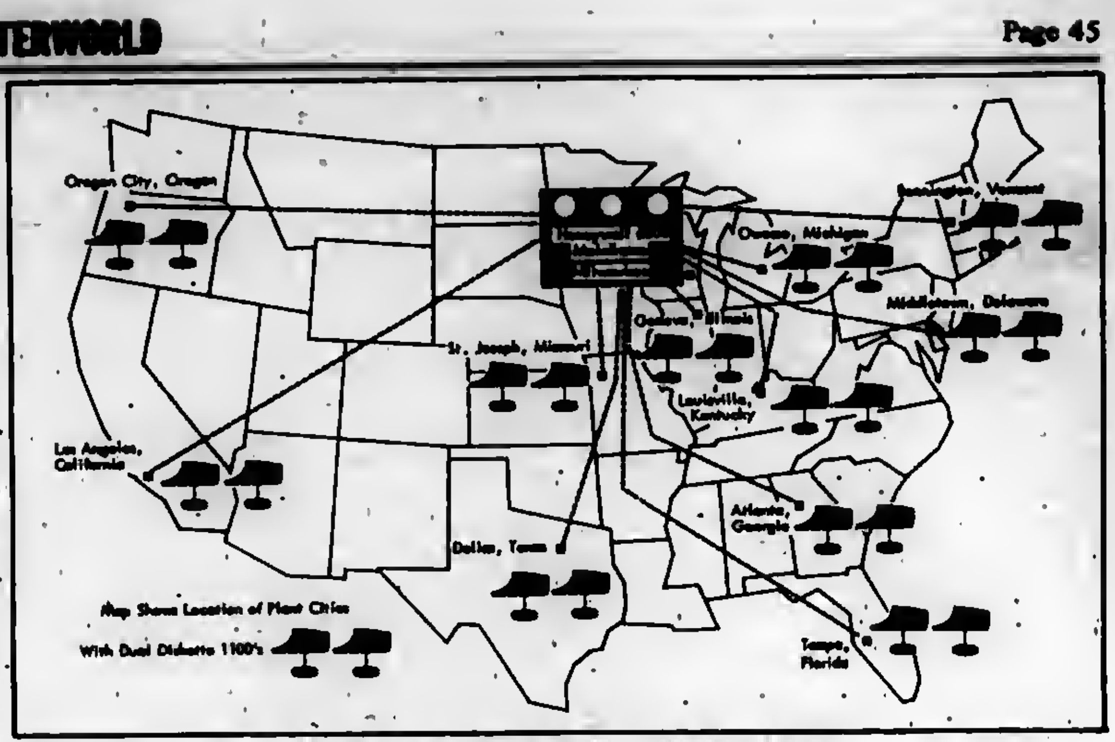
Context Releases Literature On Series 100 Page Readers

BURLINGTON, Mass. – Context Corp. has announced the new literature on its Series 100 family of optical page readers.

The package outlines the features, specifications and benefits of three models: 101, 102 and 103, the firm said from 4 Ray Ave., Burlington, Mass. 01803.

TEXAS INS

Firm's Order Entry Problems Solved by Installing Terminals



Globe-Union Dispersed Processing Network

MILWAUKEE, Wis. – Globe-Union, Inc., a manufacturer of batteries and electronic components, has solved nagging problems with input errors in its order entry process in each of 11 plants across the U.S. by installing dual Diskette 1100 terminals made by Datapoint Corp.

At the same time it's been able to register substantial improvements in employee productivity.

The Diskette 1100 units constitute a direct communications link between each of the plants and a Honeywell 6000 series computer located here.

The units in the plants are used to process orders received for the many varieties and categories of batteries made by Globe-Union, which produces the "Die Hard" battery for Sears, Roebuck and Co. and private-label batteries for users such as Gulf Oil, Sun Oil, Caterpillar, NAPA and major auto manufacturers.

Globe-Union's private-label customers send their purchase orders for additional batteries directly to the local plant nearest them, usually by mail. These incoming orders are then processed by operators using the system who enter data on the customer, his billing address, the part number of batteries ordered and the quantity.

Automatic error checks built into the unit signal the operator in the event an invalid battery number or an erroneous customer number is entered. Once in the system, the purchase order data triggers a fulfillment process in the local plant while the home office computer is automatically alerted that an order has been received. When shipment has been made, the home office computer generates the necessary customer invoice.

Globe-Union manufactures some 3,000 different kinds of batteries. Many of these batteries are maintained as stock items in the local plants, and orders are normally filled from this inventory.

Previously, the company used a teletypewriter network for communications from the local plant to the home office for order entry, with operators keying information directly into the network from purchase orders. Errors on battery part numbers contained on the purchase order and/or undetected errors made independently by the operator frequently entered the system and would be tracked down later on by employees in the home office at considerable trouble and expense.

"With the Diskette units, the visual scan they permit and the automatic error checks and verifiers built into the system, we've been able to reduce the overall incidence of input error from order entry to a minimum," John Jansky, manager of DP systems for Globe-Union, said.

"Even though many of our plants are located in relatively remote locations, the Datapoint field engineering service has been very good about providing service on those few occasions when we've had system troubles at our field sites."

For the Sears battery business, the approach is slightly different. Battery sales at each of the Sears outlets which handle Globe-Union-manufactured batteries (almost 1,000 outlets) report their sales on a weekly (or even more frequent) basis to Sears headquarters in Chicago.

This sales information is then teletyped to Globe-Union's computer operation in Milwaukee which is programmed to ship additional batteries of various types and categories to each of these Sears outlets when stocks fall below predetermined levels and to issue production orders, when required, to each of the company's plants which serve the particular Sears outlets with battery requirements. This information is transmitted to the plants via the Diskette units which maintain in their files information on local battery stocks. With this order information in hand, the rest of the administrative and invoicing process is similar to the regular private label battery business.

The advantages of this centralized approach are several: employee input errors are reduced to a minimum and data communications facilities allow much more rapid expediting of orders, compared with the mail/teletypewriter approach used in the past.

"Our dispersed processing network and the Diskette 1100s have added several new dimensions to our overall computing capability," Jansky said. "It also provides the basis for many additional applications we may want to implement in the future. I anticipate a real growth in the whole concept of supplemental on-site processing to relieve the workload on the central processor."

Responsibility for programming Globe-Union's application is shouldered by a home office group under Jansky's direction. "We use Databus, Datashare, Dataform and Assembly languages," he noted, "and find each of them useful for specialized assignments."

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TI's TICOL* II application language delivers the power of a microcomputer to data entry operators. Formats are easily programmed directly on the terminal. No other hardware is required to match your software with your needs.

The intelligent Model 742 boosts operator productivity and reduces the cost of communications. Automatic search lets the operator locate the proper cassette program, load it, and quickly begin data entry. Pre-programmed error recovery enables the operator to instantly correct keying errors. Pre-processing allows the operator to store vital programs on cassette, automatically link them under program control, validate data, and use fewer keystrokes in the process.

The Model 742 captures data independently of the host computer. Stored on cassettes, data can be polled at night while your terminals are unattended. For example, TI's Model 700 TPS Terminal Polling System with mag tape output is available.

Data Entry Intelligent Features:
- Data keyed to built-in cassette storage after editing for batch transmission.
- Convenient data entry keyboard (similar to IBM 029 keypunch) with numeric cluster.
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- Pre-processing power for numeric computation and automatic input of fixed field data.

This affordable intelligence includes cassette drives and instant hard copy with printer off/on under program control, for fast, efficient data entry keying. Optional forms printer interface and built-in modems are available.

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TRUMENTS.

Entry-Level Modcomp II in Trio of Firm's Offerings

By Esther Surden
Of the CW Staff

NEW YORK – Modular Computer Systems, Inc. (Modcomp) has announced enhancements to its minicomputer line which include an entry-level semiconductor memory version of its Modcomp II mini for networking applications.

Also introduced here was Memory Plus, a bulk core memory storage system said to fill the gap between high-performance peripheral devices and low-end main memory, and an updated version of the firm's Fortran IV language processor.

The Modcomp II/2 was designed as a satellite processor for network users who need less power than the firm's standard Modcomp II mini provides, a spokesman said.

The system can also be used as a free-standing computer in data acquisition types of applications or as a small general-purpose mini, a spokesman said.

The II/2 uses the same software as previous Modcomp II models; all standard Modcomp peripherals can be attached to it, he added.

A basic system II/2 contains 48K bytes of semiconductor memory with a 600 nsec cycle time. Word parity is standard, Modcomp said.

The II/2 processor, Direct Memory Processor (DMP), I/O bus and all memory are contained on one board, the spokesman said.

The processor has remote fill capability so programs can be loaded from a remote processor and activiated without operator intervention, he noted.

Only eight interrupts of the standard 16 found on other Modcomp models have been implemented on the II/2, Modcomp said. The standard Modcomp instruction set has been implemented, with the exception of five instructions deemed unnecessary, the firm said.

Power safe restart, floating-point hardware and multiprocessor communications hardware have also been eliminated, the spokesman added.

In addition, the DMP has been implemented in a different fashion, interrupting the CPU on a word basis. The DMP has also been integrated into the CPU, he said.

There are three Modcomp II versions. The II/2-1 with 8K of memory costs $3,995; the II/2-2 with 16K words of memory costs $5,095; and the II/2 with 24K words of memory costs $6,195, the spokesman said.

Modcomp II/2 shown here was designed for networking applications.

Memory Plus, also introduced here, is a bulk core storage device that can be used as an alternative to fixed-head disks, as a shared memory for multiple processor systems, as an auxiliary memory for storing the operating system or, with user-designed controllers, as a high-speed buffer for transmitting external input data to main memory, Modcomp said.

A minimum Memory Plus configuration including one controller, one device file and one 256K-byte core module costs $20,000.

The unit can accommodate up to two single- or dual-access files and can be expanded in 256K-byte increments to a maximum of 4M bytes.

As many as four Memory Plus devices can be attached to a single Modcomp II or Modcomp IV, allowing a maximum of 16M bytes of intermediate storage capa-

(Continued on Page 47)

Selecting a Mini –Part 5

Checking With Other Users a Final Must

By Robert E. Berkman
Special to Computerworld

There are a few points that should be considered in making a final selection that have not already been covered. These considerations should be applied after the bids have been evaluated on the criteria previously discussed.

It is important to check the references given by the vendors. Most companies should be able to give references for projects similar in nature to the one being planned by the user.

After the user narrows his choice, he should visit at least one of these references. He will find out much more by being there and talking to the references than he would over the phone.

Questions that should be asked include:

- Did the vendor deliver what was promised?
- Was communications between the client and the vendor clear and concise or were there misunderstandings during the course of the project?
- Was the documentation and the training supplied by the vendor adequate?
- Did costs change from the initial bid to delivery? If there was an increase, what was the cause of this escalation?
- Now that the system is in, what would the reference have done differently?
- What has been the reference's experience with hardware and software maintenance?

Some contractual matters also should be considered. The contract supplied by the vendor should be as specific as possible, defining the hardware proposed and describing the software that will be produced.

The development of the functional specification will have provided the user with a good basis for a contract and should become part of the contract, as should any other written communication that defines what the user will be receiving.

This article, the last in a series of five dealing with the selection and evaluation of business minicomputer systems, covers some final considerations.

Only slight deviations in hardware or software costs proposed should be tolerated for the system required to meet the specification.

It is not unreasonable for a vendor to require progress payments, but a sufficient amount of the total price (usually 20%) should be held back for the final system acceptance. The contract should define acceptance very clearly.

Overall reasonableness in price should carry some weight. A bidder who is grossly higher or grossly lower than all other bidders should be viewed with suspicion.

However, I feel the very low bidder should be scrutinized more than the very high bidder. Most low bids result from a lack of understanding of the complexity of the problems or from a company trying to buy business.

Unreasonably short schedules should also be scrutinized. Systems should not be installed in a hurry. A longer schedule is often generated by concern on the part of the vendor for doing an adequate job during the design stage; it allows time for the interchange of ideas that are needed for the completeness of design and time to train, test and run parallel in the working environment.

The installation of a computer system is a complex undertaking. A successful installation can provide great benefits to a company; a poor installation can do severe damage.

One must be ready to spend a considerable amount of management time and energy from conception through implementation to help ensure system success. If management is not willing to commit the company's resources to this endeavor, the chances of success are very small.

Berkman is president of Robert E. Berkman Associates, a Ridgewood, N.J. consulting firm specializing in the selection and installation of small business systems.

Datapoint 16K Turnkey Features Roster of Accounting Software

SAN ANTONIO, Texas – A turnkey minicomputer system designed for the independent accountant has been introduced by Datapoint Corp.

Called Dataccountant, the system includes a Diskette 1100 small business system with 16K of memory, keyboard, CRT and four floppy disks, Datapoint said.

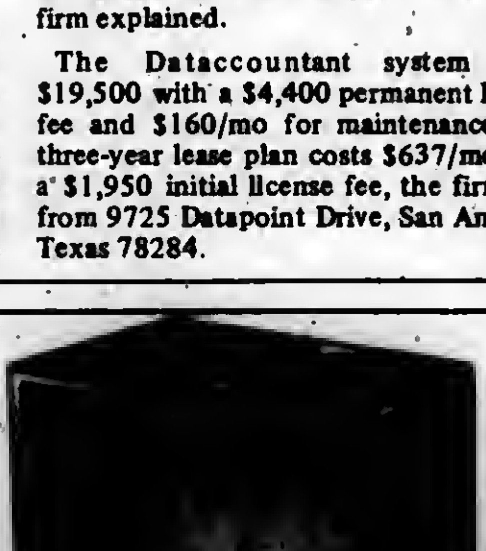
A variety of printers can be added to the system, the firm added.

A roster of accounting programs tailored specifically to the needs of independent accountants and their clients are included with the system, Datapoint said.

These include a client accounting system that produces financial statements and comparative reports for each client; a payroll package that prepares paychecks with the required state and federal reports; professional time accounting that records the utilization of the accountant's own time; a word-processing package; and an account utilities package.

Users of the system follow a "menu" operation sequence displayed on the CRT, Datapoint said. When an operator makes an error, the system flags it and indicates the correction path to take, the firm explained.

The Dataccountant system costs $19,500 with a $4,400 permanent license fee and $160/mo for maintenance. The three-year lease plan costs $637/mo with a $1,950 initial license fee, the firm said from 9725 Datapoint Drive, San Antonio, Texas 78284.



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PRIME

To Automate Writing, Editing

Newspaper People Join Programmer to Design System

OCEANSIDE, Calif. – When a newspaper here wanted to computerize, a group of editors got together and, with the help of a computer programmer, designed its own minicomputer-based system.

"This is a system designed by editorial people for editorial people," according to Bill Missett, managing editor of the *Oceanside Blade-Tribune*.

The paper publishes 200 page/week, six days a week, he said.

The system, now being marketed by One Systems, Inc. here, is based on a 32K Computer Automation, Inc. Alpha LSI-2/20 minicomputer. It includes 19 video display terminals, disk drives, line printers and typesetters and cost about $200,000.

The system has total backup, Missett said, and prints a hard copy of everything so that if the system should go down, the only story lost is the one on the CRT screen. Programs are written in Assembler language.

'Reporter the Printer'

With the minicomputer system, the reporter's copy, after being edited, goes directly into an automatic typesetter. "In essence, the reporter is the printer, too; his version after editing is what appears in the newspaper," Missett said.

For the *Blade-Tribune*, one of the major advantages is the system's ease of operation. "A key problem with many computerized systems is the difficulty the average person has in learning how to run them," Missett said. "People are forced to change their habits to fit the way the computer works."

But this system "can be operated easily and informally by anyone. It requires little training and is adaptable to changing requirements."

There are 13 CRTs in the news department with 12 CRTs distributed to reporters, editors and stringers to handle the copy. One CRT is allocated for wire service proofreading and input of some correspondence copy.

In operation, reporters write their stories on the video display terminals. What the reporter types shows directly on the video screen rather than on a piece of paper.

When a story is complete, the reporter transmits it to the minicomputer, which assigns the story a number.

"The message that appears to the reporter at this point, for example, would be 'FL350,' which tells his story is about to be filed under story number L350 (L meaning local)," Missett said. The reporter then records this story number on a manual news log so it can be accessed later.

"The story is still on the screen," he added, "so any last minute changes can be made."

All changes made, the reporter hits another button and his article is stored in the mini's memory. The mini counts the story lines, gives the reporter the line count and sets his console up for the next story.

The story can then be called up any time from the computer by typing in a transaction code and the name and file number of the story to be retrieved.

Editing Capability

"When a story is accessed, 2,000 characters of the story appear on the screen at a time, leaving room to delete, add or move text around," Misset noted.

As each portion is edited, it is transmitted back to the computer and the console is automatically filled with more of the story.

When the entire story is edited, the computer provides a new line count and that version becomes the only version accessible under L350.

Once a page is ready for typesetting, the editor calls up the numbers of all stories for that page from storage to the typesetter. (Headlines are set separately, but also on a full-page basis.) When the assembly department receives the copy and headlines, the material is checked against the page dummy and the full page is pasted down.

The minicomputer system is also being used by the newspaper's classified department. Five CRTs are assigned to the department to capture linear advertising; this approach has resulted in a gain of 20% in sales time, according to a spokesman.

Under the old system, every ad was kept track of manually. With the minicomputer, however, "you simply type the ad and it is filed automatically under the proper classification, alphabetized and typeset," Missett said.

Modcomp Brings Out Trio of Offerings

(Continued from Page 46)

city per CPU, Modcomp said.

Users will work with Memory Plus as an I/O device by using standard programming techniques, the spokesman said. The system, however, will appear to function as an extension of main memory, he said.

Because there is no rotational latency, device access can occur within 1 μsec following service initiation, he added.

Enhanced Compiler

Announced with the II/2 and Memory Plus was an enhanced Fortran IV compiler system said to offer 60% improvements in compilation and execution times over the former Modcomp offering.

The language processor offers Ansi X3.9-1966 capabilities plus extensions.

The processor, which can be installed on Modcomp II and Modcomp IV minis, can be installed in the field without the addition of more core memory or other hardware features if the user already has the firm's former Fortran IV release, Modcomp said.

The Fortran processor costs "less than $100 with documentation for users who wish to upgrade" and is included with Modcomp systems being delivered, the spokesman said.

The compiler features free-format read/write to simplify the use of Fortran from remote interactive terminals, the firm said from 1650 W. McNab Road, Fort Lauderdale, Fla. 33309.

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Based on DG Minis

IST Turnkeys Handle Custom Data Entry

By a CW Staff Writer

DALLAS – The Advanced Interactive Data Entry (Aide) systems from Interactive Systems Technology (IST) are three turnkey minicomputers designed for custom data entry applications or terminal system emulation, the vendor said.

Based on Data General Corp. (DG) Nova and Eclipse minis, the three Aide systems are the Remote Terminal System (Aide/RTS), the Remote Processing System (Aide/RPS) and the Business Processing System (Aide/BPS).

Aide/RTS was designed specifically for on-line real-time applications, the firm said. Multiple video displays and printers connected to a mini can communicate on-line to a centrally located host mainframe, a spokesman explained.

Because Aide/RTS is software-driven, it can communicate in any line protocol environment and to any host mainframe, IST said.

More Processing

The Aide/RPS includes the capabilities of the Aide/RTS but has the additional processing capabilities required for distributed intelligence applications, the firm said.

Data collection, remote job entry and local data base management functions can be performed by this model, the spokesman added.

Concurrent Operations

Concurrent operations on Aide/RPS can include combinations of interactive real-time data entry, data collection, remote job entry and local processing, according to IST.

The remote processing system can support a mapped foreground/background environment, it noted.

The Aide/BPS was described as a stand-alone real-time information system with interactive accounting, inventory control, payroll and other business applications.

A foreground/background environment allows the execution of an application in background with the execution of interactive data entry and inquiry in foreground, a spokesman said.

Typical Systems

A typical Aide/RTS includes a Nova 3/12 with 16K words of memory, communications interface, two CRT terminals and one 165 char./sec printer for about $22,000, including all software, the spokesman said.

A typical Aide/RPS configuration would include an Eclipse S200 with 48K words of memory, two communications interfaces, 10M bytes of disk, one 800 bit/in. magnetic tape drive, a 300 line/min printer, 300 card/min reader and eight CRTs for approximately $80,000, he added.

The Aide/BPS includes an Eclipse S200 with 48K words of memory, 10M bytes of disk, one 800 bit/in. magnetic tape drive, 300 line/min printer and 12 CRTs for approximately $95,000 from the firm at Suite 135, 4450 Sigma, Dallas, Texas 75240.

DEC Designs Newspaper Editing Unit

MAYNARD, Mass. – A turnkey text-handling and text-editing system from Digital Equipment Corp. was designed for use by small- to medium-sized newspaper publishers, DEC said.

The Decedit system permits stories to be entered into a computer system directly from terminals, on-line character readers or paper tape, DEC said.

The system is controlled by a PDP-8 mini; users can access stories via CRTs for editorial correction, the firm added.

Up to 32 terminals can be tied to the system with the data files stored on disk pack, DEC said.

Decedit can be used as a stand-alone system or connected to larger systems for further typeset processing or on-line wire service collection, the firm said.

A basic Decedit system with 32K of memory, 4.8M bytes of storage and one VT61T editing terminal costs $75,000 from DEC at Maynard, Mass. 01754.

ACE Unveils Multiapplication Mini

WINSTON-SALEM, N.C. – The ACE-000/40 from Automation Control Engineering (ACE) is said to be a multiapplications system designed for industrial and business environments.

Incorporating a 16-bit Texas Instruments, Inc. 960B minicomputer, the system also includes a Tri-Data Model 20 digital read/write recorder that stores 250,000 16-bit words on a single Carti-File; Centronics Model 306 matrix printer operating at 60 line/min; and a TEC, Inc. TEC-450 CRT, the firm said.

Software for the system includes a complete set of utilities, ACE said. Peripheral control boards are also available.

The system costs $20,000, it added from Box 11709, Winston-Salem, N.C. 27106.

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J.M. Aubry, Canadian Government

"This was an exceptionally well organized seminar. The material presented was significant and useful. This seminar would be of great practical value to someone without computer contracting experience as well as serving as a useful outlet and review for those with more background and experience."
William C. Prinn, Director, Advanced Planning
Chessie System, Baltimore, Md.

"I had no idea that we would have the opportunity to communicate so closely on an informal basis. That, combined with your excellent preparation, made this experience the most rewarding seminar experience I've had. I commend you for what I regard as a most worthwhile seminar, and thank you for your genuine interest in communicating with, and not merely to the participants."
SV, Attorney, Worcester, Mass.

"The appropriateness of this seminar is extremely important. This area of the Computer Science field has generally received little or no attention from user, vendor or the legal professions."
D.J. Connally, Development & Control Manager
Norton Company, Worcester, Mass.

Roy N. Freed is the Seminar Leader
Roy N. Freed is internationally known for his acuity and expertise in this field, and he will personally direct the entire seminar. A graduate of Yale Law School, Roy has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private corporate practice in greater Boston with the firm of Pollock, O'Connor and Jacobs. He teaches at Boston University Law School, and has written many articles on this subject, including "Computer Fraud, a Management Trap" (Business Horizons), and "Get The Computer System You Want" (Harvard Business Review). He is the author of the book, *Computers and Law — a Reference Work*, now in its fourth edition, and he also edited the complete, extensive course materials used in this seminar.

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Lack of Support Staff Cited

Mini Makers Seen Indifferent to First-Time Users

DALLAS – "If you are a potential end user and have never dealt with a minicomputer supplier, you may be surprised by your first experience. Some of the larger mini makers exhibit an air of indifference toward new end users that borders on arrogance.

"It may seem that you have to prove yourself worthy of owning one of their computers," Wayne Churchman, programming supervisor for the city of Dallas, told a Computer Caravan session here recently.

This rather disturbing attitude is not accidental, but the result of a deliberate emphasis by most mini makers on sales to OEM customers and sophisticated end users, Churchman said.

This strategy reduces the manufacturers' requirements for support personnel and provides low-risk profits. Regardless of past advertising by the large mini makers about being total systems companies, mini makers have not been in the applications software development or support business, he added.

The only problem with this strategy is that it limits the potential market rather severely, Churchman said. Users in the business applications area will demand more support than most mini makers have been prepared to offer, he noted.

This is one of the reasons IBM is looking strong in the business area. Of the major minicomputer companies, it is perhaps the only company staffed to provide the support demanded by this market, Churchman added.

Expect the major manufacturers to move toward providing more support to end users, he said. Some will move faster than others in this area, he predicted.

The primary impetus in the growth of minicomputers over the next five years will come from two application areas: the use of minicomputers in networks and the use of minicomputers in general-purpose stand-alone applications, Churchman continued.

The resounding theme in data processing is distributed processing, Churchman said.

In the late '60s the trend was toward centralization of computer facilities, but the economics of minicomputers have now reversed the trend, he continued.

Minicomputers can provide rapid response to users who are remote to the central facility and can still take advantage of the processing capabilities of the larger computer. Both the hierarchical and ring network structures offer certain advantages, he said.

Potential Users

The important point, Churchman emphasized, is that large system users are all potentially users of multiple minicomputer systems. The city of Dallas already has three such systems, with more in the planning stages, he added.

The second applications area which will see significant growth over the next five years is the stand-alone general-purpose minicomputer application.

Business applications on minicomputers have been slow in developing because of several factors, he indicated. Mini suppliers have not been willing to supply the support this market demands, nor has suitable software been available. But all of this is changing, Churchman said.

In addition to the business area, time-sharing users are finding dedicated minicomputer systems to be a bargain compared with time-sharing services for some applications. Time-sharing service companies are going to take a beating as many users switch to minis over the next five years, he predicted.

Mini Software

While technological advances have driven hardware development, there have been no similar advances in software technology, Churchman added.

However, operating systems for minis now provide facilities that, in some cases, rival or exceed those of the larger systems. These general-purpose operating systems support concurrent real-time, on-line and batch tasks in multiple programming languages and provide complete file management facilities, dynamic memory allocation and in some cases virtual memory language.

But perhaps the biggest news is in programming languages. With memory prices dropping, there has been a trend in many applications to buy more memory and use a higher level language, such as Fortran, he said. This trend will continue with Cobol becoming commonly available on the larger minis. The availability of Cobol may give the business applications area just the shove it needs, he added.

"While I don't feel that Cobol is the best language in the world, it has become the de facto standard for the larger commercial DP installations," Churchman said.

Data base management systems (DBMS) will also become available on the larger minis and should also provide a push in the business applications area, he added.

During the next five years, continued hardware improvements can be expected, either in terms of lower costs or increased performance, Churchman said.

The trend to semiconductor memories will continue with increased use of memories with extensive error detection and correction capabilities. Memory chips are becoming larger with 4K chips now in common use. "A 64K chip should be a reality within two years," he predicted.

The price/performance of peripheral devices will also improve. Paper tape and cards will die a slow but natural death. CRTs and cheaper disk storage will reign supreme, he said.

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Data General Machines Interfaced To Summagraphics Tablet/Digitizer

FAIRFIELD, Conn. – Summagraphics Corp. has an interface which it said links its Data-Tablet/Digitizer to minis made by Data General Corp. (DG).

The interface can occupy any slot of a Nova, Nova-2, Nova-3 or Eclipse and extends the full capabilities of the tablet to DG users, Summagraphics said.

The interface transfers X-Y coordinate information from the Summagraphics controller to the mini and operates in either programmed I/O or interrupt mode.

I/O instructions permit flexible program operation in either mode, the firm said.

The digitizer operates with a resolution of 100 line/in. and 200 line/in.

The interface with a 15-ft connecting cable costs $1,750 from Summagraphics at 35 Brentwood Ave., Box 781, Fairfield, Conn. 06430.

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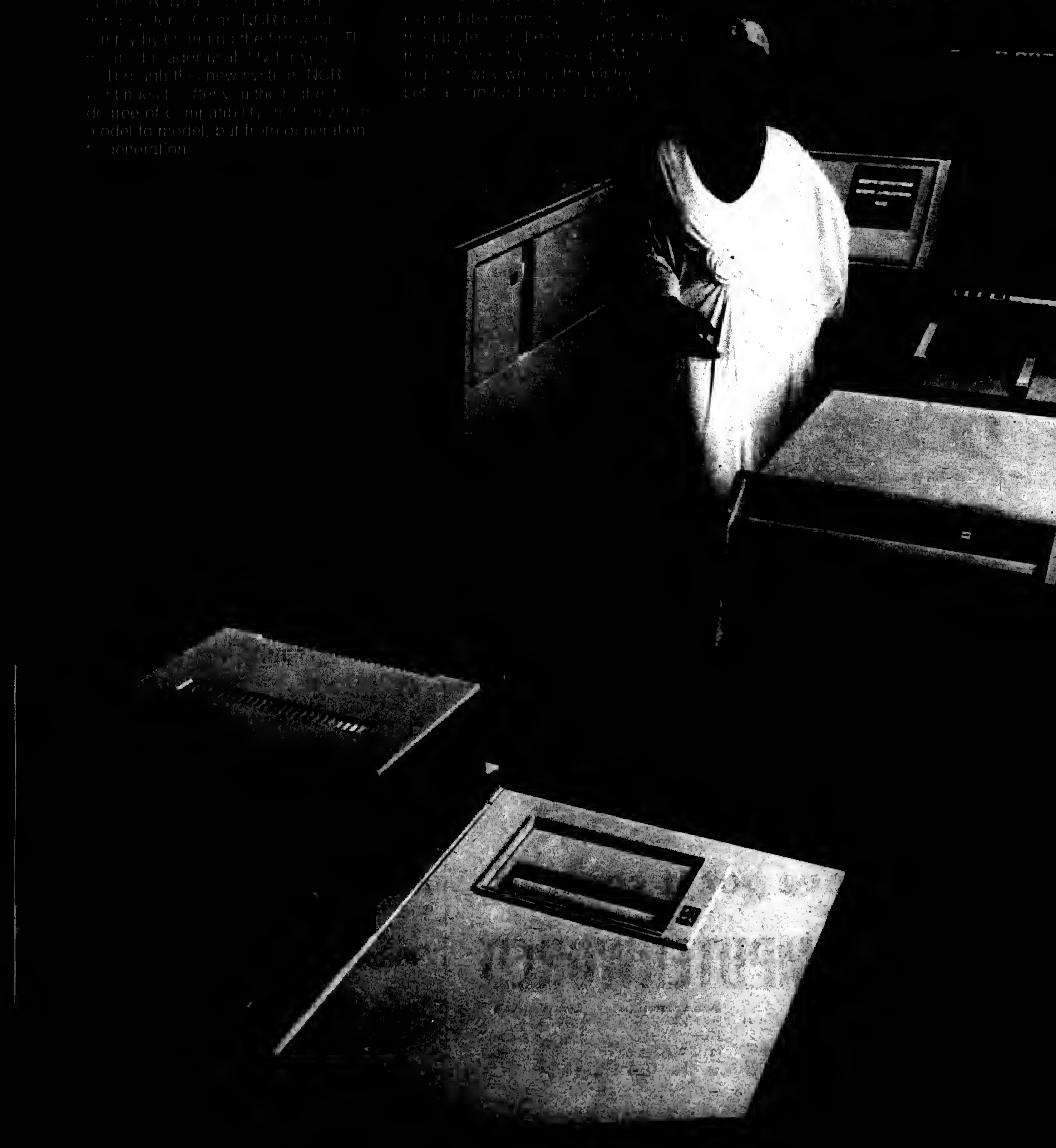

Service Bureau, Minis Centralize Financial Control

By Patsy Jacobs

Special to Computerworld

BEAUMONT, Texas – The question of the pros and cons of centralized financial management has been answered at my firm by combining the use of a service bureau and a minicomputer network.

As Gulf Consolidated Services, Inc. expanded, the need for central financial control became increasingly apparent. Our roots go back to the founding of Gulf Supply Company. The owner and two employees sold pipes, valves and related supplies to refineries and contractors in the area.

Today, there are 10 companies, over 1,200 employees and a chain of electrical supply stores.

First Try a Flop

Our initial attempt to centralize financial management and control failed. In 1956-57 we installed an IBM 360 system with on-line terminals at our sales outlets.

The idea was to input sales and purchasing information at the source to a central computer which would do billing, payables and inventory management while producing reports.

The system looked excellent on paper; software costs for operating it, however, ran higher than anticipated.

But the main problem was that the input parameters required by the system didn't provide the flexibility needed at the points of sale. We needed a way to do the detail work at the local level while maintaining audit and cash control at a central facility.

Posting Machines Next

We removed the 360 and installed six NCR 395 posting machines for writing invoices and checks. These created by-product punched paper tapes, which we delivered to a service company.

The tapes updated our general ledger and provided new data for financial and other reports required by management.

Everything was fine through the middle of 1974. By then, we were writing some 40,000 invoices a month, leading to backlogs in posting. Some invoices were mailed three or four days after we got the billing information.

So we began searching for a more efficient way to write invoices and payables, while also preparing data for the service company's NCR Century 201.

In January 1975, we replaced the posting machines with six NCR 399 accounting minicomputers. Four of these are currently used for writing invoices; the other two are used for payables.

Five of the units have 10K of memory and one magnetic tape cassette handler; the sixth machine has a 14K memory and two cassette handlers. The last is used for sorting information onto tape cassettes and also for program preparation.

Our posting machine operators learned to operate the NCR 399s in a matter of days. The machines step them through each function.

Furthermore, I have a realistic means of keeping track of the productivity of operators. At the end of each shift, reports can be written that list the exact number of lines and invoices (or checks) written by each operator.

With this system, delivery tickets written when orders are taken at the point of sale eventually become invoices. When the local sales people write these tickets, they list account numbers assigned to the customers, the major class codes of the items sold, the quantities sold, the costs and resale prices.

These delivery tickets are forwarded to us daily by mail. Our operators key from the written information and extend the charges.

After we extend the delivery tickets, the billing section verifies each one. Two electrostatic copies are then made of the top portion of each ticket. One is mailed to the customer, and the other copy is placed in the open invoice file.

When payments are received, we pull the open invoices from the file and write the customer and invoice numbers onto tape cassettes, along with the amounts paid. The deposit totals are balanced, and the cassettes are sent to the service company daily.

This eliminates the invoices from the master computer files. At the end of each month, the computer only writes aged statements for customers with payments due. Our credit manager receives an aged analysis report.

The same system is used for payables. Once a vendor's invoice is approved at the local level, it is forwarded to our payables section, which marks the pay date and either types the check or pulls it from the files if it is prewritten.

The invoices and checks are given to us in batches along with an adding machine balance tape. We voucher each check and, at the same time, write the vendor number and amount on a cassette. At the end of each batch, the NCR 399 balances to the adding machine tape.

Jacobs is DP supervisor for Gulf Consolidated Services, Inc.

DAC Printer Systems Linked to IBM 3/8

STAMFORD, Conn. – Digital Associates Corp. (DAC) has enhanced its DAC/3 Model 400 and Model 700 line printers to interface with the IBM 3/8, the firm said.

The DAC/3-400 is a 132-character, 400 line/min printer featuring a sound-deadening cabinet and static eliminator, single line memory and a paper slew rate of 15 in./sec. The DAC/3-700 printer is a 750 line/min printer.

The Model 400 costs $17,750 or $445/mo on a three-year lease plan. The Model 700 costs $22,995 or $545/mo on the three-year plan from the firm st 1039 E. Main St., Stamford, Conn. 06902.

Persci Has Diskette Drive

MARINA DEL REY, Calif. – A dual-diskette OEM drive said to be smaller in size than many single-diskette drives is available from Persci, Inc.

The Model 270 incorporates two read/write/erase head assemblies and measures 8.6 in. by 4.4 in. by 15 in., the firm said.

The drive is IBM 3740-compatible and accommodates a total of 3.8M bits of data per drive in IBM 3740 format, Persci said.

The unit costs $880 in 50-unit quantities from the firm at 4087 Glencoe Ave., Marina del Rey, Calif. 90291.

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8:30 am—9:50 am: REGISTRATION. Pick up your seminar materials and get ready for two days of information-packed sessions.

9:50 am: WELCOME. *Susan Alt*, Editor, *Business Insurance; Edward J. Bride*, Vice President, Editorial Services, *Computer World*.

10:00 am: FACILITIES PLANNING: WHAT TOP MANAGEMENT NEEDS TO KNOW. You learn what steps you can take in the planning stages to minimize computer operations risks from *Robert H. Courtney*, Director of Data Security and Privacy, IBM Corp.

11:15 am: EMERGING RISKS—CLOUDS ON THE HORIZONS. *Robert V. Jacobson*, Assistant Vice President, Chemical Bank, reviews areas of increasing risk which threaten to become major management concerns, such as theft, sabotage, physical loss, and illegal access.

12:15 pm: LUNCHEON. Take this opportunity to get acquainted with your fellow registrants. Exchange ideas and information.

1:30 pm: RISK ROUNDTABLES. Three concurrent sessions—attend the one of your choice. The sessions repeat at 3:30 pm so you can attend a total of two.

EMPLOYE DISHONESTY. *William A. Mahoney*, Vice President, Marsh & McLennan Inc., tells you how to handle a fidelity loss when the computer is involved.

AUDITING THE COMPUTER. How to make sure the computer program does ONLY what it is supposed to do . . . discussed by *Joseph J. Wasserman*, President, Computer Audit Systems Inc.

ERRORS & OMISSIONS RISKS. An examination of the many problems inherent in providing data processing services for customers, including quantifying the possible errors and omissions exposure, types of insurance available and user problems that have been experienced.

3:30 pm: RISK ROUNDTABLES. Repeat of above sessions. Attend the one of your choice.

5:30 pm: RECEPTION. Join your fellow registrants for cocktails and stimulating conversation.

6:15 pm: DINNER.

7:30 pm: NEGOTIATING THE COMPUTER CONTRACT. *Roy N. Freed* of the greater Boston law firm of Pollock, O'Connor & Jacobs tells you how a properly negotiated lease contract is one of the most effective means of obtaining relief from a problem with a computer equipment supplier.

FRIDAY, JUNE 18

9:00 am: HOW TO PREPARE FOR BUSINESS INTERRUPTION. *Paul W. Miles*, Executive Vice President, I. Berman Co., discusses the risks involved in a computer stoppage interrupting your company's operations and how you can effectively plan for recovery.

David Warren, CPCU, Partner, Warren, McVeigh, Griffin & Huntington, tells you how to fund business interruption losses through insurance and self-insurance so you get the money you need to get back in business.

10:30 am: LOSS PREVENTION ROUNDTABLES. Two concurrent sessions. Each repeats at 1:30 pm so you can attend both.

RISK MANAGEMENT: DATA TRANSPORTATION & NETWORK COMMUNICATION. *Rees S. Himes*, Assistant Vice President, Marsh & McLennan Inc., identifies and discusses various kinds and causes of losses through transporting and telecommunicating data and tells of ways to minimize and control losses.

CASE STUDIES OF COMPUTER RIPOFFS. *Donn B. Parker*, Senior Information Processing Analyst, Information Systems Group, Stanford Research Institute, takes an in-depth, eye-opening look at two examples of the computer as a tool of the corporate criminal.

12:30 pm: LUNCHEON. No speaker, so take advantage of this opportunity to discuss areas of mutual interest with your fellow registrants.

1:30 pm: LOSS PREVENTION ROUNDTABLES. Repeat of 10:30 am sessions. Attend the one of your choice.

3:30 pm: HOW TO IMPLEMENT A GOOD RISK MANAGEMENT PROGRAM. Panel members *William D. Hahn*, Principal Consultant, George Betterley Consulting Group, *Donald P. Fitzgerald*, Manager of the Management Consultant Services Division of Ernst & Ernst, and a corporate client discuss the nuts and bolts of establishing an effective and workable risk management program for data processing exposures.

4:30 pm: ADJOURNMENT.

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COMPUTER INDUSTRY

CI Notes

Sanders vs. IBM Date Set

CONCORD, N.H. – U.S. District Judge Hugh Bownes recently told attorneys for Sanders Associates, Inc. et al and IBM to be ready for trial by Jan. 1, 1979 in the antitrust case filed by Sanders.

Bownes also set forth procedures for winnowing out documents, commenting, "The problem seems to me to be that too many documents are being produced."

All documents to be used must be examined by the parties not later than Jan. 1, 1977. Documents claimed to be privileged must be identified.

Bownes reminded the parties he, not they, would decide on the relevancy or materiality of a document or question.

He told counsel to file by July 1 a suggested timetable for depositions and interrogatories, which should be started this summer.

Counsel must file a statement of the type of evidence that will be based on summaries and analyses of data made by a computer by Sept. 1.

Calcomp Date Confirmed

SAN FRANCISCO – Judge Ray W. McNichols has confirmed Nov. 8 as the trial date for California Computer Products, Inc.'s (Calcomp) antitrust suit against IBM.

At a recent pretrial hearing, the judge also denied Calcomp's request for documents IBM claimed as privileged that were produced in the Control Data Corp. and government cases.

SEL Closes California Center

FORT LAUDERDALE, Fla. – Systems Engineering Laboratories, Inc. (SEL) has closed down its West Coast design and development center and consolidated operations at its headquarters here.

The move was made because of serious logistics problems, according to Gerard Guyod, director of planning and technology.

There has been no reduction in the scope of the work and no delays were experienced as a result of the move, he said.

The West Coast facility in Newport Beach, Calif., was established less than a year ago, but that was before Buyod was in charge of the operation, he said.

Sun, Graham End Talks

GRAHAM, Texas – Sun Ventures, Inc. and Graham Magnetics, Inc. have ended talks relating to the acquisition of Graham by Sun.

The firms said a $26 million stockholder suit filed against Graham which charged that fraudulent and misleading statements led to investments in Graham caused legal problems preventing completion of the proposed acquisition.

Doubt Demand

OEMs Skeptical About IBM-Type Floppy

By Molly Upton
Of the CW Staff

Although independent makers of floppy disk drives surveyed recently were generally skeptical of market demand for IBM 3600-type double-sized drives, they agreed they will put such a unit into production if the market demand is there.

Two media makers indicated they are ready and able to provide the double-sized diskettes required by devices announced recently by both IBM and Burroughs Corp.

Many of those surveyed based their reactions on the assumption the IBM drive, included in the 3601 and 3602 financial controllers [CW, April 12], contains the same format as that in the 3740 data entry system. The IBM double-sided floppy has a capacity of 560,000 characters.

The Burroughs floppy, unveiled as part of the B80 system [CW, May 3], has a capacity of 1M byte per diskette, which the firm said was accomplished through increased bit density. Both drives use a head on each side to read and write the data.

Burroughs Chairman Ray W. Macdonald said at the B80 press conference the firm is exploring all avenues of marketing, including OEMing subsystems.

However, a spokesman said, no further information is available at this time.

Shugart Studying Market

Ferrell Sanders, director of marketing for Shugart Associates, Inc., said he's "not sure a double-sided drive makes sense for our customers.

"As a practical matter, very few are using IBM compatibility – so why go to double capacity in that manner?" he asked.

But, "we're going to make what the customers want," he said, and the firm is studying the marketplace.

In Sanders' view, there are less expensive ways to increase capacity, such as doubling linear density or packing more bits on a track and increasing the number of tracks on one side.

Sanders was "kind of surprised" at the manner in which IBM chose to increase the capacity on diskettes. He said he suspected IBM's next step would have been to double the linear recording.

However, he conceded that would destroy compatibility with 3740.

Sanders said he thinks the Burroughs announcement will stir up activity in the floppy drive area as Burroughs' competitors explore using and/or increasing the capacity of floppy drives.

A Magnetic Peripherals, Inc. spokesman said that firm is looking at the IBM announcement and expects to have a position on product possibilities soon. Memorex Corp. would not comment on future product plans.

(Continued on Page 57)

Programmable Printer Terminals To Grow Sixfold by 1980: IDC

By a CW Staff Writer

WALTHAM, Mass. – The installed base of programmable printer terminals – both stand-alones and clustered systems – will more than increase six-fold from 47,300 in 1974 to 303,300 by 1980, according to a report from International Data Corp. (IDC), a market research firm here.

The entire terminal printer market is expected to double between 1975 and 1980 from 299,200 units to 719,000 units.

Programmable stand-alone units should grow from 81,500 in 1975 to 274,000 in 1980 while the number of clustered units will soar from 12,500 to 240,000, according to IDC.

Editing keyboard printers, which were defined as having interactive capability and buffer memory, will more than double from 17,000 to 38,000 in 1980, the report predicted.

Conversational keyboards – those with no buffer memory – should decline from 175,000 in 1975 to 130,000 in 1980, IDC said.

Remote batch units will grow from 13,200 to 37,000. The report defined remote batch terminals as those with input/output functions but no processing capability.

One of the reasons remote batch units will not show greater growth is that an increasing number of units are expected to fall in the programmable category, according to Joan Ross, IDC analyst.

The report, entitled "Terminal Printer Market," found the average installed terminal printer to be a slow-speed unit, compared with the higher speed printers on the market.

Although serial printers were also readily available in 80- or 165 char./sec speeds, 45% of the currently installed serial printers surveyed operated at 30- to 40 char./sec.

Similarly, 77% of installed line printers operated at 350 line/min or less, while printers with speeds of 600- to 1,200 line/min were available.

The average installed terminal printer operated only 20 hours a week even though it was available for printing for about 60 hours, the survey found. It was not uncommon to have a printer operate only one hour a day, IDC noted.

"With these slow speeds and short print-

(Continued on Page 55)

In Year Ended July '75

CPU Base Up 36.8% in Brazil

RIO DE JANEIRO, Brazil – Aided by growth in the mini and large computer areas, the installed base of computers in Brazil rose by 36.8% or 1,021 systems in the year ended July 1975.

The growth rate represented a decline from the 46.6% rise reported the previous year, according to figures released by the Brazilian government's Coordinating Committee of Electronic Processing Activities (Capre) and reported in *Data-News.*

With a total of 3,793 systems installed, Brazil ranks 12th worldwide; the country's installed base represents 65% of all computers in South America, according to the article.

Installations of minicomputers, those valued at less than $30,000, totaled 2,266 or 59.7% of the entire base at the end of July 1975.

There were 678 new minis sold in Brazil during that year for a growth rate of 42.6%, the second fastest growing category..

Taking minis out of the total figures left Brazil with a 29% growth rate for the year, according to Capre.

Burroughs ranked first in the mini field with 944 systems for 41.7% of the market. Olivetti came in second with 33.9%; Philips third with 10.2%; and NCR fourth with 8% among 10 vendors in the field.

Burroughs Ranked First

Looking at the entire installed base in terms of numbers of systems, Burroughs ranked first with 1,167 units of 30.8%. IBM was second with 906 systems or 23.9%, followed by Olivetti with 769 systems or 20.2%.

But excluding the minis presented a different picture. IBM, with 906 systems,

(Continued on Page 55)

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Brazil's CPU Base Grows 36.8%

(Continued from Page 54)

ranked first with 59.4% of the installed systems and Burroughs was second with 223 units or 14.6%.

Although very large systems, those costing more than $1.2 million, represented the fastest growing segment of the market with a 45.2% growth rate, they accounted for only 1.6% of the number of total installations. During the year, 19 systems were installed for a total of 61.

The growth rate for large systems, those valued at $600,000 to $1.2 million, fell considerably, with a 13.9% increase compared with 60% a year ago.

The 10 new systems brought the total of large computers in Brazil to 82; they accounted fot 2.1% of all Brazilian installations, according to the figures.

The rise of medium systems also slowed down. Costing from $180,000 to $600,000, this category rose by 11.8% or 35 systems compared with 28.6% in the 1973-74 time frame.

Of the total 332 medium-sized systems in Brazil, Burroughs had 25.9% of the market and IBM 48.8%. This was the sector where IBM's share was smallest, excluding minis, according to *DataNews*.

Honeywell-Bull ranked third with 12.7% of the medium-scale market, followed by Univac/Siemens with 6.6% and NCR with 2.7%, the figures showed.

Small Machines Up

Small computers, those costing $30,000 to $180,000, were second only to very large systems in terms of percentage increase and second to minis in total units, *DataNews* said.

This category grew by 279 computers or 36.2% for a total of 1,052 small systems installed. The statistics included a reclassification of 48 Digital Equipment Corp. units from minis to small systems and some NCR units from small systems to minis, the article observed.

IBM was the leader with 625 systems or 59.5% of the market. It installed 150 machines during the year but, as with medium systems, its ranking dropped by 2%.

Burroughs ranked second in small systems with 11.3%, followed by DEC, 9.6%; Hewlett-Packard, 6.8%; and Univac/Siemens 4.1%, according to the figures.

Study Predicts Rise In Printer Terminals

(Continued from Page 54)

ing hours, the average terminal printer uses only 5,600 original pages each month: 33% of the output is single-ply paper and 67% is multiply; 83% is standard paper and 17% is custom," the IDC report stated.

The total terminal printer output, 15 billion original pages in 1975, will increase to almost 50 billion by 1980, the report said. This growth in the volume of paper use will be the result of two majot factors, it forecast – growth in the use of paper by installed printers (3% to 6% a year) and the rapid growth of the terminal printer market.

Burroughs Trims Belgian Plant

DETROIT – Burroughs Corp. has closed the manufacturing portion of its Seneffe, Belgium plant.

A spokesman said the plant's capacity had "become excess to our needs." The plant's production of Series L business minis and Series TC terminals is being transferred to other international facilities.

The engineering portion of the plant will remain in operation.

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Data Communications Course #1020 —Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

New York	**Summit Hotel**	**Sept. 13-15**
Miami	**Holiday Inn Airport Lakes**	**Nov. 29-Dec. 1**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Seattle	**Airport Hilton**	**May 5-7**
Chicago	**Hyatt Regency O'Hare**	**June 16-18**
New York	**Summit Hotel**	**June 23-25**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Wash., D.C.	**Stouffer's National Center Inn**	**April 26-27**
Atlanta	**Hyatt Regency Atlanta**	**May 3-4**
St. Louis	**Marriott at Lambert**	**May 24-25**

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Hilton**	**May 10-11**
Chicago	**Hyatt Regency O'Hare**	**May 17-18**
Wash., D.C.	**Stouffer's National Center Inn**	**May 24-25**

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OEMs Doubt Demand for IBM-Type Floppy Drives

(Continued from Page 54)

A spokesman for one large OEM source of IBM-compatible floppy drives said his firm would look at the product when it comes out and then evaluate the market before it decides whether to make a similar drive.

"Just because IBM announced it doesn't mean we'll automatically say we'll have one too," he said.

However, " 'IBM' is a magic word. People will ask for a product even if they don't need it," he added.

IBM's improved access times – six to nine times faster than its previous floppy system – barely brings the speed up to those offered by many independents, he observed.

Product Life Questioned

Bill Young, manager of applications engineering at Orbis Systems, Inc. said he tends to believe the IBM product will remain internally in IBM systems and also wondered about the life of the product.

As far as the OEM world, he agreed with others when he said he doubts if he'll see the drive in the OEM market soon because there are too many other less expensive ways to increase capacity.

"It's a technologically sound way to develop the capacity of the disk, but I don't necessarily approve of the approach since I think it places a burden on the media," he said.

On the other hand, he added, "it's a forgiving way to get double the capacity."

Assuming the format is 3740-compatible, the tolerance level for error is quite high, he explained.

Orbis has been thinking more of either increasing the track density or bit density, he said.

"I don't believe we'll come up with an identical product," he said, adding "I don't know if" the IBM double sided-type floppy drive "will find its way into too many non-IBM applications.

"It seems there would be a bit more wear on the media," but perhaps manufacturers have found a way to overcome this, he said.

Robert Siggelkoe, computer group product and planning manager at BASF, said media makers will be able to supply double-sided diskettes with little trouble.

However, he noted there will be a significant loss on the yield of diskettes so prices will be higher.

Currently those diskettes being shipped for one-sided use are certified only on one side, giving the manufacturer two tries at certifying a diskette. However, for use in double-sided recording and reading, both sides must meet specifications, he observed.

Siggelkoe said BASF has not supplied floppies to be used on both sides, "the flippy floppy," since he feels there is a current lack of write protection that could allow inadvertent use of the wrong side.

Some of the IBM System 32 sector disk customers are asking for write inhibit holes as additional protection, he said.

Siggelkoe assumes IBM and Burroughs have done something to afford this protection. From a manufacturing standpoint however, both sides are coated and polished, and the other side could be formatted, he said. "It's been waiting for the equipment.

Carl Holder, manager of product management at Information Terminals Corp., agreed making diskettes for drives that read both sides should be no problem.

"We've been making a double-sided floppy for two years," he said, explaining these have to be removed and flipped over for use on the other side.

The change by IBM won't bother the media manufacturer because it doesn't require new tooling, he said. Increased density, such as on the Burroughs, can be handled by electronic means, he added.

One potential problem Holder sees is user identification of the proper type of diskette. For instance, users have to select the right kind of format for their particular machines; the onus will be on the salesperson to discern the right media for individual customers, he said.

Holder thinks there will not be much standardization on the floppies other than in the IBM systems.

"It seems like a lot of people are going to be departing." For instance, at the National Computer Conference there will be several vendors introducing products with a minidiskette that is about 5 in. in diameter with about 100,000 bytes, he said. The current units have an 8-in. diameter.

Even within the IBM systems, Holder suspects IBM will have two sets of floppy drives for the near future as it will not want to impact its 3740 base.

Siggelkoe remarked he doubts if the double-sided flexible disk will be used much in the data entry application field since it has a higher capacity than needed.

DPers Gets Posts On Patent Body

WASHINGTON, D.C. – Representatives from IBM and Bell Laboratories have been appointed to the Patent and Trademark Office Advisory Committee.

Secretary of Commerce Elliot L. Richardson named Wallace C. Doud, vice-president of commercial and industry relations at IBM, and William L. Keefauver, general legal and patent counsel at Bell Laboratories, to the committee.

The committee will advise the Commerce Department's Patent and Trademark Office.

The major part of the committee's efforts will be devoted to considering patent matters, such as the Patent and Trademark Office's patent-examining operations.

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For Distributed Processing

B80s Aimed at L Series Users, Banks

By Nancy French
Of the CW Staff

DETROIT – Burroughs recently announced B80 product line will be aimed at L series users as well as about 10,000 banks that, judged by the number of transactions per day, would be ideal candidates for a system in the B80's price range [CW, May 3], according to Ray W. Macdonald, chairman of the board at Burroughs Corp.

The B80 line, which Burroughs said will be expanded to an entire family of compatible products by the end of this year, is Burroughs' answer to distributed processing.

"Five years ago, large and medium-size organizations generally thought centralization was the way to go for data processing," he said. Eventually, however, regional officials found themselves losing control of their records to a centralized data base.

At a time when more management responsibility was being placed in local cost and profit centers, lack of sufficient management information at that level became a problem, he said.

As the centralization trend increased, the central DP facility became so overburdened with transaction processing it was also unable to provide management reports needed at headquarters.

B80 Work Began in '69

As early as 1969 Burroughs began to question the concept of centralization, and work started on the B80, he said.

B80s near final assembly at plant in Plymouth, Mich.

While distributed processing becomes more feasible as costs decline, this in no way signals any dimunition in the need for good management information at headquarters, Macdonald said. Large central computers will still be needed to interface with smaller distributed systems.

The new product line puts "sophisticated information" where it is needed – in both the regional offices and in the headquarters operations – and at the right price, he said.

Programs written for the B1700 and the B700 need only be recompiled for use on the B80. As a result of products introduced later this year, the user will be able to upgrade "with ease" by module, with complete program compatibility, according to Macdonald.

B80 system users are expected to operate that system easily after a one-day training program, he said.

Many standard packages will be available for the system, including programs that have been in Burroughs' library for many years and are well tested, Macdonald said.

While Burroughs will be happy to tailor these packages to users' needs for a fee, the firm's policy will be to urge customers to adapt to the standard application programs as much as possible.

CW Photo by N. French
Ray W. Macdonald

"Customizing is tremendously costly to the user and becomes a trap," Macdonald added. The large user understands this already.

The firm will continue to manufacture the Ls as long as there is an attractive market for them, Macdonald said. The B700s, too, still have considerable life, he said, adding that the recently announced B730 considerably enhanced this product line [CW, April 12].

Development of the B80 was parceled to many different parts of the Burroughs organization, Macdonald explained.

While the concept and product description originated in the home office here, much of the engineering development was completed in Cumbernauld, Scotland, he said.

The super mini disk was designed in Glenrothes, Scotland, but is being manufactured by "various OEMs" which Macdonald declined to name. The disk drives, however, are being manufactured by Burroughs' Westlake, Calif., plant.

Design of the printer came originally from an OEM, but the model presently being offered with the system will be manufactured by Burroughs in Glenrothes, Scotland. The cassette drive will also come from Scotland, he said.

The 60 char./sec printer comes from the firm's Belgian plant, and the faster printer will be made in Paris, he said. Integrated circuitry comes from Rancho Bernardo, Calif., and circuit boards from Carlsbad, Calif. The displays are being made in Plainfield, N.J.

Macdonald attributed his company's success in competing against IBM to the firm's long history in the recordkeeping business – especially banking, which he called Burroughs' number one market.

"It's no secret Burroughs was founded by a banker," he said.

Who is Miles Benson, and why is he writing about things that went wrong?

Not many people aspire to become experts on failure, but the man behind the pseudonym "Miles Benson" has made a career-long hobby of things that go wrong in the computer business. Collecting information from contacts around the country, "Miles" retires to the back seat of his Edsel where, for several years, he has turned out columns on catastrophes (and less spectacular failures) for *Computerworld*. Now he has compiled the best of the worst into a single book:

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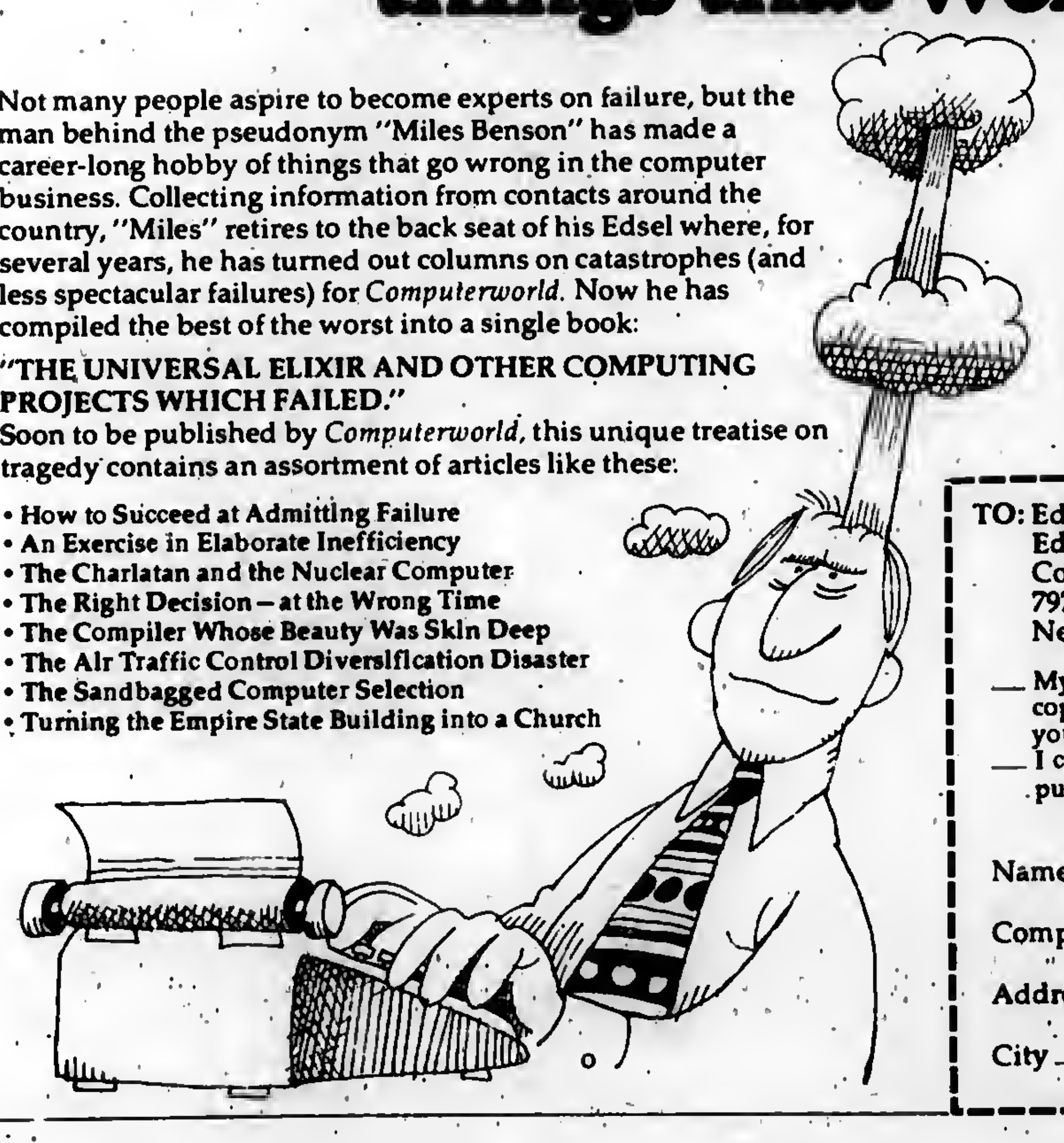


Software Vendor Believes Industry Still 'Prenatal'

By John P. Hebert
Of the CW Staff

ATLANTA – "The software industry is really in a prenatal stage," Guy A. Colaneri, vice-president of Management Science America, Inc. (MS), said here in a recent interview.

Today, software houses cannot keep up with the hardware state of the art, he said, but that will change in the future.

However, if MSA's last quarter – the second best quarter in the company's history – is any indication, then the "birth process" should begin soon. It can at least be taken as "a significant sign of growth of the software industry," Colaneri said.

"We feel most of the prospective users of software are still virtually untapped, he said, but business for MSA is "superb."

For organizations seriously in the software industry, business is good, he said.

MSA has recently adapted its software systems to compete in the IBM 3 market, "but the market there is limited for our type of software, when you consider the vastness of the IBM 360/370 and Burroughs and Honeywell market.

"It's a fraction of that market;" Colaneri noted.

'Dramatic Growth'

MSA has realized "dramatic growth" since its bout with bankruptcy in 1972 [CW, Sept. 20, 1972], but Colaneri believes the "general industry is still virtually untapped," even though it contributed about $6.5 million to MSA's total $8.5 million to $9 million revenues in 1975.

CW Photo by J. Hebert
Guy A. Colaneri

The banking market, which has been a staple of MSA's revenue diet, can be defined very easily, he said. Many years ago, most of the software industry's efforts were directed toward the Federal government, insurance companies and banks, but the increasing use of microcomputers and minicomputers "allow a much greater influx into general business."

MSA is beginning to expand into the market opened by minicomputers, Colaneri indicated, and has also expanded into the foreign market, with some sales on "some of our software in Europe.

"We have only scratched the surface of minicomputer installations. When this market is quintupled in the near future, then you're talking about a significant market that will have to be dealt with," he said.

Minicomputer vendors will have to offer packaged applications software to enhance their positions, Colaneri said.

But that packaging won't hurt the software industry at all, he added. Software houses will work out some agreements with the minicomputer vendors, except IBM, he predicted.

If IBM got into packaged software for its hardware, then it would hurt any software company because of its massive funding and sales organization, he said.

However, Colaneri believes packaged software is not an area which IBM wants to enter.

The role of software houses in the mainframe market is defined by the need of large machines to increase their computing power, "and that's where software comes in," he said.

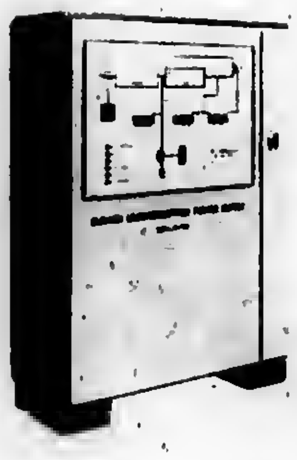
"The software houses must create interfaces independently [of the hardware vendors] to maintain a much more flexible and applicable piece of software," he said.

BGS Systems Formed As CPE Consultants

LINCOLN, Mass. – Three Harvard Ph.D.s who comprised the nucleus of an internal consulting group for Honeywell Information Systems' senior management have established BGS Systems, Inc., a consulting firm here specializing in computer performance evaluation (CPE).

Harold S. Schwenk Jr. is president of BGS. Jeffrey P. Buzen and Robert P. Goldberg are vice-presidents.

BGS can be reached through Box 128, Lincoln, Mass. 01773.



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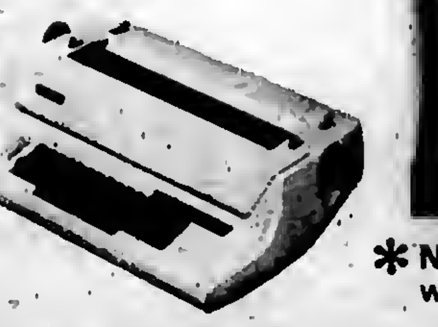

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Executive Corner

- John L. Curry Jr. has been elected president of MIS, Inc.
- Frederic J. Robbins has been elected to the board of directors of Electronic Memories and Magnetics Corp.
- Gerald S. Newton has been appointed director of media deelopment at Information Terminals Corp.
- Donald D. Winstead has been named director of marketing for the Microsystems Division of the Instrument Systems Group at Fairchild Camera and Instrument Corp.
- Richard F. Musson has been named vice-president of marketing at Technology Marketing, Inc.
- Thomas A. Loose has been elected vice-president of Recognition Equipment, Inc. and will continue to serve as secretary and general counsel for the company.
- J.J. Burke has been named vice-president of western operations for Univac.
- M. James Arachtingi has been named vice-president of pricing at Control Data Corp.
- Jack Robinson has been named vice-president and midwest regional manager of International Computer Equipment, Inc.
- Peter B. Heyler has been named chief financial officer of Okidata Corp.
- Theodore W. Robinson Jr. has been appointed executive vice-president of Optical Scanning Corp.
- Clarence W. Rife has been appointed vice-president of customer service at Scan-Optics, Inc.
- Julian Sanchez has been appointed vice-president of manufacturing of Western Peripherals, Inc.

Sperry Results Hit Record High; Univac Sales Rise 11% in '75

NEW YORK – Record earnings for the final quarter and year were the story at Sperry Rand Corp.

Revenues from Univac's computer-related products and services rose 11% to more than $1.4 billion during the year.

New orders for computer systems increased 9% to $1.25 billion for the year; commercial computer bookings in the fourth quarter were up 19% over what the firm termed a strong fourth quarter last year.

The worldwide installed base of computer systems grew 15% in fiscal 1976 to $7.4 billion and has been growing at a compound annual rate of more than 19% in the past five years, the company said.

For the year, Sperry's earnings rose 16% to nearly $145.3 million or $4 a share compared with $125.2 million or $3.54 a share last year, when there was a $5.4 million gain from the sale of land.

Revenues rose 5% to $3.2 billion compared with $3 billion in fiscal 1975.

In the fourth quarter, earnings rose 12% to $41.2 million or $1.08 a share compared wtih $36.8 million or $1.04 a share in the same period last year.

Revenues increased by almost 9% to $894.6 million compared with $823.2 million in the 1975 period.

Earnings in the previous periods were restated to reflect foreign exchange gains and losses as incurred. These included a charge of nearly $3.5 million in the recent quarter compared with a $1.7 million charge in the year-ago period.

For the year, Sperry recorded a $2.8 million gain compared with a $6.2 million charge in 1975.

'Consistent Growth'

"For the full year, we maintained consistent earnings growth in a poor economy through strong performances in computers, farm equipment and defense systems," according to J. Paul Lyet, Sperry Rand chairman.

"We believe the business climate for capital goods will continue to improve, although somewhat slowly. The order backlog at March 31, 1976 was $1.8 billion, about the same level as a year ago," he said.

Farm equipment orders were up in the fourth quarter by 57% and revenues for the year increased 16%, the firm said.

Although bookings for fluid power business were down in the early months, they rose 78% over those of the year-ago fourth quarter.

The Office Equipment Division reduced its losses as unprofitable lines were dropped and restructuring of the business continued, the firm said.

Sperry Remington's shaver and personal care products moved from a loss last year to a small profit in 1976. Revenues were about the same as last year for Sperry Division while Sperry Flight Systems revenue rose 20%.

The firm managed to reduce inventories by $140 million or 14.5% in the year to $825 million compared with $965 million last year.

"Looking ahead, we believe the economic recovery will continue, faster in some countries than in others," Lyet said.

"The impact of economic forces such as the recent monetary disturbances remains uncertain and may affect our quarter-to-quarter earnings in the months ahead.

"But barring major economic disruptions, our plans call for continued earnings growth in fiscal 1977," he added.

DPers' Achievements Receive Recognition

Several DPers were among those recognized for achievements in various areas recently. William R. Hewlett and David Packard, president and chairman of the board, respectively, of Hewlett-Packard Co., were named reciplents of the Vermilye Medal of the Franklin Institute.

The medal is awarded in recognition of outstanding accomplishment in industrial management.

Leo Esaki, IBM fellow and manager of device research at IBM Thomas J. Watson Research Center, has been elected as a foreign associate of the National Academy of Sciences.

Charles P. Lecht, president and chairman of Advanced Computer Techniques, Inc., was the only representative from the computer industry to be named by the Gallagher Presidents' Report as one of the 10 "best corporate chief executives of achievement for 1975."

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Earnings Reports

CUBIC
Year Ended Dec. 31

	1975	1974
Shr Ernd	$1.22	.....
Revenue	92,394,502	$74,512,605
Earnings	2,667,467	(1,096,868)
3 Mo Shr	.54	.....
Revenue	26,623,913	16,952,763
Earnings	1,176,263	(2,007,519)

DATA GENERAL
Three Months Ended March 13

	1976	1975
Shr Ernd	$.42	$.35
Revenue	34,089,000	24,639,000
Earnings	4,016,000	2,666,000
6 Mo Shr	.79	.70
Revenue	63,112,000	48,758,000
Earnings	7,519,000	5,662,000

APPLIED DIGITAL DATA SYSTEMS
Three Months Ended Feb. 29

	1976	1975
Shr Ernd	$.25	$.14
Revenue	4,999,891	3,269,240
Earnings	969,437	512,906

BOOTHE COMPUTER
Year Ended Dec. 31

	1975	1974
Shr Ernd	$1.09	.....
Revenue	41,033,000	$38,094,000
Disc Op	(734,000)	(457,000)
Spec Cred	a3,624,000	.....
Earnings	4,241,00	(3,550,000)

a-Gain from extinguishment of debt.

ADDRESSOGRAPH-MULTIGRAPH
Three Months Ended Jan. 31

	1976	a1975
Shr Ernd	$.13	$.12
Revenue	134,886,000	143,163,000
Earnings	1,011,000	967,000
6 Mo Shr	.19	.22
Revenue	266,714,000	263,206,000
Earnings	1,562,000	1,762,000

a-Restated to reflect accounting change for translation of foreign currency.

MILGO ELECTRONICS
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.21	$.71
Revenue	9,094,000	10,207,000
Earnings	360,000	1,176,000

COMPUTERVISION
Year Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.71
Revenue	$21,645,000	25,222,000
Earnings	(4,134,000)	1,636,000
3 Mo Shr	.01	.05
Revenue	5,699,000	5,870,000
Earnings	22,000	116,000

SCIENTIFIC SOFTWARE
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.49	$.50
Revenue	4,807,000	3,726,000
Spec Cred	278,000	312,000
Earnings	585,000	619,000

SYNCOM
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.03	.....
Revenue	1,167,221	$830,049
Earnings	51,116	6,438
9 Mo Shr	.06	.01
Revenue	2,999,293	2,146,384
Earnings	143,797	28,761

WYLY
Year Ended Dec. 31

	1975	a1974
Revenue	$66,149,000	$75,373,000
Disc Op	(31,701,000)	(13,291,000)
Loss	52,246,000	15,306,000

a-Restated.

COMPUTER USAGE
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.22
Revenue	$1,913,128	1,066,522
Tax Cred	.....	82,000
Earnings	(177,142)	173,653

BRADFORD COMPUTER & SYSTEMS
Year Ended Dec. 31

	a1975	b1974
Shr Ernd	$1.02	$.53
Revenue	67,391,000	59,006,000
Tax Cred	78,000	103,000
Earnings	4,118,000	2,129,000
3 Mo Shr	.27	.....
Revenue	16,726,000	16,422,000
Tax Cred	.....	96,000
Earnings	1,067,000	(606,000)

a-Preliminary. b-Reflects net charges of $1.81 million in the year and $1.74 in the quarter resulting from provisions for loss on a clearance account and on sale of several minority investments.

COMPUTER CONSOLES
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.60	$.94
Revenue	8,466,176	9,208,404
Tax Cred	450,947	835,000
Earnings	1,054,540	1,638,030

DATA DIMENSIONS
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.61	$.61
Revenue	5,267,000	4,316,000
Tax Cred	50,000	242,000
Earnings	474,000	492,000

DATA 100
Year Ended Dec. 31

	1975	1974
Shr Ernd	$1.59	$1.57
Revenue	95,851,000	69,720,000
Tax Cred	1,451,000	1,765,000
Earnings	5,694,000	4,847,000
3 Mo Shr	.24	.50
Revenue	27,855,000	21,623,000
Spec Item	a(567,000)	b452,000
Earnings	854,000	1,608,000

a-Reversal of tax-loss carryforward credit. b-Tax-loss carryforward.

DATUM
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.03	$.08
Revenue	13,503,134	14,559,326
Tax Cred	32,000	.....
Earnings	58,721	124,536

ELECTRONIC ASSISTANCE
Year Ended Jan. 31

	1976	a1975
Shr Ernd	$.58	$.47
Revenue	36,711,000	38,614,000
Disc Op	4,000	6,000
Tax Cred	394,000	349,000
Earnings	1,095,000	669,000

a-Restated to reflect discontinued operations.

GENERAL AUTOMATION
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.08	.....
Revenue	18,293,000	$14,021,000
Tax Cred	75,000	.....
Earnings	186,000	(2,057,000)
6 Mo Shr	.08	.....
Revenue	33,286,000	28,214,000
Tax Cred	75,000	.....
Earnings	193,000	(1,880,000)

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IDC Deutschland (one of Germany's largest market research and consulting firms) projects that the average growth rate of computer systems sales in Germany will be 14% through 1977; but the growth of certain segments of the market will be much greater. The rate for minicomputers and data communication terminals will be more than 30%. Software and services will experience an annual increase of 20-30%, while data entry equipment is expected to show a sales increase of 25% per year.

Computerwoche, the EDP weekly for the German computer community, reaches the people who control the computers in this $4.4 billion market. With a circulation of 21,000, *Computerworld's* German sister publication, serves German DP professionals with the same editorial excellence that has made *Computerworld* a leading EDP publication in the United States.

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Call Bill Borrelli 349-3610
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IMS Analysts/Programmers And Project Managers

R.J. Hansen Associates, Inc., International Management and Information Systems Consultants, currently has career positions available. Applicants must have a combination of two to three years experience in systems design and COBOL programming. College preferred. On-line, telecommunications data base management (IMS/VS) experience highly desirable. Top benefits including profit sharing plan. Write or call:

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555 Capitol Mall
Sacramento, Calif. 95814
(916) 441-7232

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Colorado School of Mines User Services/Faculty Position

Work in Computing Center in user consulting, documentation, program library. Some teaching, conducting workshops and short courses. Experience in interactive computing and use of computers in instruction or engineering essential. Previous user services or teaching experience desirable. MS or PhD degree.

CSM is a special-purpose engineering school, offering degrees in mineral engineering fields at BS, MS, and PhD level. All students in all curricula use the computer, a DECsystem-10 timesharing system.

Send letter of application, resume, and references postmarked no later than June 1, 1976, to A.R. Brown, Director, Computing Center, Colorado School of Mines, Golden, Colorado 80401. *An equal opportunity employer.*

NEW HAMPSHIRE PROGRAMMER-ANALYST

Peerless Insurance Company located in Keene, N.H., is seeking (3) three programmer-analysts. We require a minimum of 3 years' Property and Casualty Insurance application's experience. Applicants should have Cobol language and experience on "360" or higher level IBM equipment. Salary will be commensurate with experience. Relocation expenses will be company paid as well as all fringe benefits provided by the company. Send your resume in confidence to: Michale S. Cabot, Personnel Director, PEERLESS INSURANCE CO., 82 Maple Ave., Keene, N.H. 03431. *an equal opportunity employer.*

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Must maintain our aging administrative systems and lead their renewal by introducing database and real-time technology. With a staff of two seasoned Programmer/Analysts, additional applications must also be designad and integrated into current operations. Tact, problem solving ability and supervisory capacity are assumed. Administrative (or commercial) systems development experience, technical prowess, and college background must be substantiated.

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affirmative action employer.

SYSTEMS ANALYST

The University of Montane is seeking candidates for Systems Analyst to develop and implement new information systems for the financial area of university operations. Successful candidate will possess e bachelor's degree in business administration, accounting, or e related field and have five years of experience in tha data processing field, or an equivalency of aducation and experience. Background in college or university financial applications is preferred. Must have considerable knowledge of computerized systems, hardware and software, design and analysis, management practices.. Salary — $15,111 per year. Applications are due by May 21, 1976.

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Mark Fuller
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32 W. Randolph St.
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(312) 346-9400

College Faculty Position

A faculty position is available starting Sept. 1976 to teach Data Processing and Accounting at the freshman end sophomore levels. Duties include teaching Data Processing and Accounting, serve as academic advisor to students and to participate in curriculum development and evaluation.

Applicant should possess at least a Bachelor's degree (Master's preferred) in Business Management or related field. Work experience in the field of commercial-type Data Processing as well as teaching experience is required. Rank and salary commensurate with experience and preparation.

Applications must be received by June 1, 1976. The college is an equal opportunity and affirmative action employer.

Please reply in confidence to:
Mr. Edward Ruate, Chairman
Business Division
Cape Cod Community College
West Barnstable, MA. 02668

SYSTEMS PROGRAMMER

Seeking a person with a degree in a computer-related field and a minimum of two years system programming experience with one year involving OS or DS/VS to work with two others maintaining OS/VS1 on our 370/145. Salary starts at $15,636 with good fringe benefits. Please send your resume to: Jeff Billin, University of Idaho, Computer Services, Moscow, ID 83843. Closing date May 31, 1976. *The University of Idaho is an Equal Opportunity/Affirmative Action employer.*

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SYSTEMS ANALYST
$19-23,000+14% Bonus

Fortune sized co, leader in field mounting major expansion dual 370/158 seeks min, 1yr concentrated IMS Data-Base-security/recovery/design/patch and D.C. environment exp. Degree essential. Paid relocation, interviews, expenses. Northeast suburban location.

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COMPUTER PROGRAMMER

Position available at our General Office in Minneapolis, Minnesota. We need an individual with two years IBM BAL coding experience for applications programming on our online reservation system. Excellent fringe benefits; salary based on applicable experience. Please send your resume, including detailed experienced to:

Industrial Relations Department
North Central Airlines, Inc.
7500 Northliner Drive
Minneapolis, Minnesota 55450
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SYSTEMS ENGINEER

We are seeking someone with 5-7 years prior programming experience with a minimum of 1 year experience in the Systems Engineering function.

The applicant must know assembler language, have installed DOS/CICS/VS, & programmed CICS applications. Must be thoroughly versed in ANS-COBOL. Must have knowledge of VSAM & DL-1. The individual should have e college degree or equivalent experience.

We offer an outstanding compensation & benefits package. Our company is located on a 50 acre campus in central New Jersey.

Qualified applicants are invited to forward their resume & salary in complete confidence to: Ted Brown, Personnel Administration.

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We are looking for several sharp determined professionals who would have an interest in working with a unique leading edge technology employing the computer to automate the development of new applications from initial definition through COBOL code generation and system documentation. Join a company with clients nationwide that has tripled sales in the last 4 years. Degree plus 1-5 years experience. Send resume with salary history to R. Eckert, Computer Power, Inc., 661 Riverside Ave., Jacksonville, Fla. 32204.

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Master's degrees preferred. Three years commercial experience required.

Operations and instruction, IBM 360 Disk System. Instruct in programming and operations: RPG, BAL, FORTRAN, COBOL, PL/I and Systems. 12 month positions commencing August 1, 1976, in pleasant suburban area.

Salary commensurate with training and experience.

Send resumes and salary requirements to L. Jay Brinkmeyer, Director of Data Center, Butler County Community College, P.O. Box 888, El Dorado, KS 67042.

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A consulting and computer services company specializing in the design and implementation of Material Requirements Planning systems is seeking individuals with programming and systems background in manufacturing applications. An understanding of B/M Processor and M.R.P. is required. Production and Inventory Control user experience will be a plus. A challenging opportunity with a professional team. Excellent salary/company benefits. Please send resume, including references to:

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CICS Programmers	18K +
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Balt., Md. 21201 (301) 752-8540

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INTERNAL CNSLNT NYC-Manufacturer, advenced deg $28M

IMS Deta Base Specist NYC metro area Batch & D.C. mode $23-26M

IMS Syst Anal-batch in O.C. mode NY metro eree Pd relocat. $23-26M

MGR SYY/Proj-scientific/commercial $28M

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HEAD OF INFORMATION SERVICES

Opening for Head of Information Services Department will be available July 1, 1976. Experience in data processing and data base management required. Education at B.S. or higher level is required. Salary open.

Reply to:
Dr. Fred Davis, Director
Division of Numerical Services
Mississippi State University
P.O. Drawer CC
Mississippi State, MS 39762
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T. Makosky
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The University of the Pacific seeks a Coordinator of Computer Education. This faculty position involves coordinating academic computer usage, consulting with faculty & advanced students, & teaching courses in Computer Science. A Ph.D. in Computer Science & Burroughs 6700 experience is preferred. Send a vita & the names of 3 references to: Dr. R.W. Pulleyblank, Chairman, Search Committee, Office of the Academic Vice President, University of the Pacific, Stockton, CA 95211. Application deadline is June 1, 1976. *The University is an equal opportunity/affirmative action employer.*

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Responsibilities cover the full range of system development and maintenance. Opportunity for teaching and professional development.

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Salary range between $12,000 and $15,000, depending upon experience and qualifcations.

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Oberlin College is an Affirmative Action/Equal Opportunity employer and welcomes applications from minotiry and woman candidates.

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The Center provides both academic and administrative computing services to the campus, including systems design and programming for the administrative users and education and consulting for the academic users. Current equipment includes a 3MB 370/158 operating under OS/VS2. Major software includes IMS, CICS and TSO.

Required qualifications are:
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2. Experience with IBM teleprocessing and time-sharing systems.

Highly desirable additional qualifications are:
1. Experience with IMS.
2. Experience with University administrative systems development.
3. M.S., MBA or Ph.D. degree.

Deadline for application receipt is May 24, 1976.
Apply to: Personnel Office, University of Alabama in Birmingham, Birmingham, AL 35294.
Equal Opportunity/Affirmative Action Employer

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Our Company, the leader in its field, has an opening for an outstanding programmer/analyst for assignments in financial, marketing and manufacturing systems.

Candidates should have at least two years programming experience with major emphasis on COBOL. Desirable experience includes: BAL or RPG; on-line systems, Textile/Apparel industry.

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EXECUTIVE DIRECTOR

NERComP, Inc., is a non-profit organization whose purpose it is to promote the sharing and exchange of educational and research computing services among its membership, comprising forty institutions of higher education in New England. The organization operates a telecommunications network and conducts research and educational activities in promotion of its general purpose. The Executive Director is the chief operating officer, and is responsible for managing the operations and supervising the employees, cooperating with other consortia and organizations concerned with networking, and maintaining close contact with the member institutions in order to best serve their needs, and seeking grants to support activities related to these purposes. The Executive Director reports to a Board of Trustees.

The principal qualification is interest in, and familiarity or experience with, computer networking for education and research. Other necessary qualifications are ability to manage affairs of NERComP and supervise its employees. Candidates should be able to write well and meet with staffs and faculties of member institutions to discuss common issues and problems of networking. Salary range $22,000 to $26,000 annually, depending on qualifications and experience. Interested persons should send their resumes before 15 May 1976 to Mr. John Alman, Secretary of the Corporation, NERComP, Inc., 40 Grove Street, Wellesley, MA 02181.

NERComP, Inc., is an Equal Opportunity/Affirmative Action Employer.

SENIOR SYSTEMS DESIGNER
DESIGN AUTOMATION TEAM

Major reorganization and expansion has created the need for individuals to provide strong technical leadership as a key member of our new Design Automation Team. You will participate in the high level planning of a new data management system, which includes responsibilities for defining the system architecture and implementation of the total system software.

Education should consists of CS or EE at any degree level, preferably advanced degree. Strong background with several years of related experience is needed in data base design, computer aided design, large software system development (USER EXPERIENCE ON IBM/370 SYSTEM), and high-level language concepts. Experience with software tools (e.g. compilers), interactive terminal systems (e.g. interactive graphics), and Design Automation exposure in an electronic manufacturing environment very beneficial.

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Senior
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$16,000 to $19,000
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The positions require varying levels of experience, and offer candidates opportunities to move in many directions, depending on your interests and background. Opportunity to further your knowledge in data base, and grow with a rapidly expanding department.

We offer excellent benefits, including company paid Blue Cross and Blue Shield Health Insurance. Write, including education, experience and salary history, to:

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Females & Minorities are encouraged to apply
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Savings & Loan Service
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Computer Sharing Services, Inc. provides services commercially and requires Programmer Analysts to implement new applications. IBM equipment using the "Canton" software.

Send resume to:

Mr. JIM SYNDER
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Sr. Analyst

Conn. insurer is expanding it's life div. Immed need for indiv with actuarial bkgd & DP Life Systems exp. Client has excellent reputation, & is open on salary (Fee Paid), based on qualifications. Contact Stan Durbas (in confidence).

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(203) 278-7170

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Opening for two (2) Field Engineers for a dual processor Univac 1108 system and a Univac 418 system. Salary open. Reply to:

Dr. Fred Davis, Director
Division of Numerical Services
Mississippi State University
P.O. Drawer CC
Mississippi State, MS 39762

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PROGRAMMER EXPERIENCED

The Brookings Institution Social Science Computation Center needs a programmer with a BS or BA and 2-3 years experience. FORTRAN and Assembly Language necessary. Will do maintenance, installation, testing and development of systems and applications software on a DECsystem-10. Experience with time-sharing system desirable. Flexibility and desire to work with people necessary. Liberal fringe benefits including 5 weeks vacation per year. Send resume to: Ms. K. Alberlini, SSCC, 1775 Mass. Ave N.W., Washington, D.C. 20036. EOE, M/F.

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Full-time teaching position available Fall, 1976. Candidates must have commercial programming experience, multi-language capability, a minimum of a bachelor's degree, and the desire to strive for excellence in education. This program in electronic data processing offers the associate degree as well as service courses. Facilities include a dedicated 360/40 and complete access to a large 370/158. Send resume to Dr. Eleanor Bushee, Associate Dean for Academic Affairs, School of Technical Careers, Southern Illinois University at Carbondale, Carbondale, Ill. 62901.

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APPLICATION PROGRAMMER

To work in a fast moving DOS/VS Data Processing shop. An immediate opening for a programmer who will get involved in Data Base/Data Communications Applications in the Health Industry. Currently installing the first of several CICS DL/1 applications. At least two years of solid COBOL programming experience required and experience with CICS, DL/1 a definite plus.

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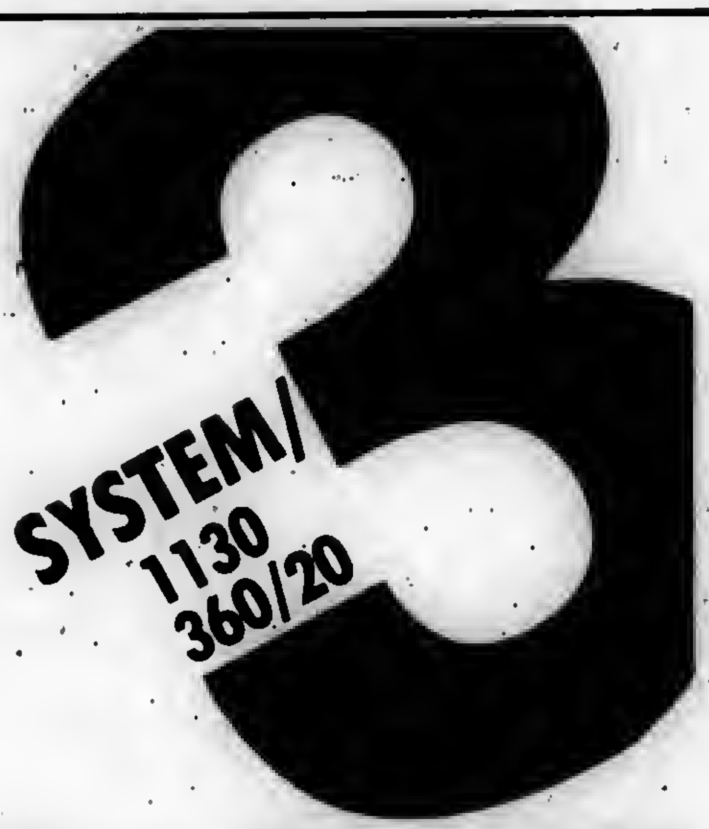

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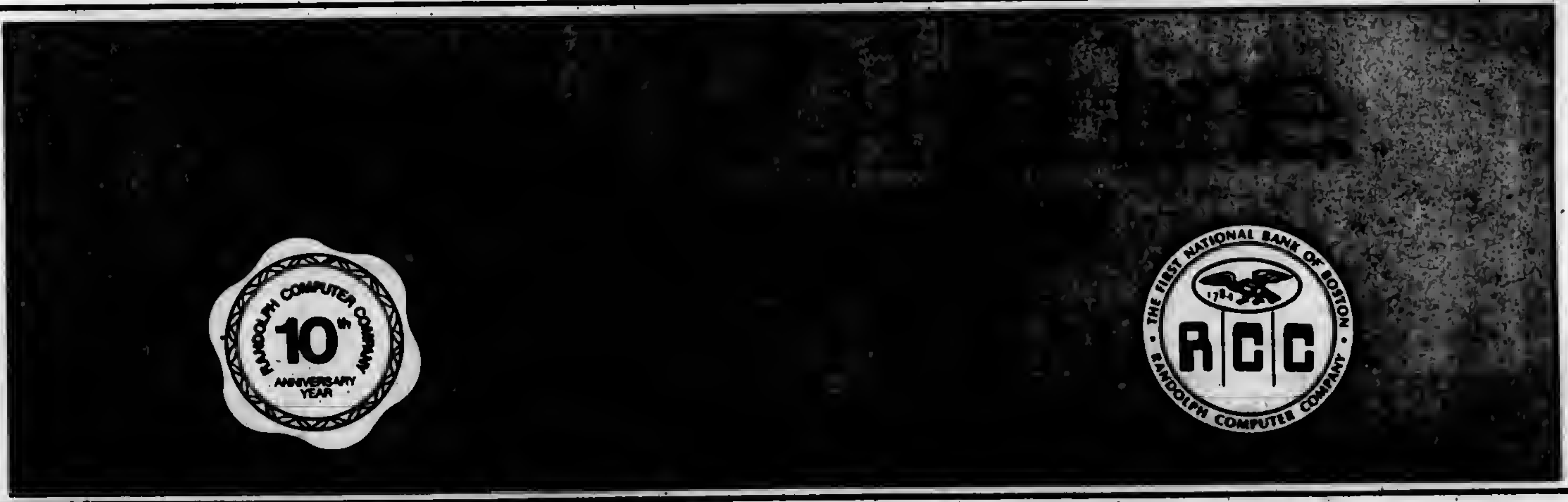
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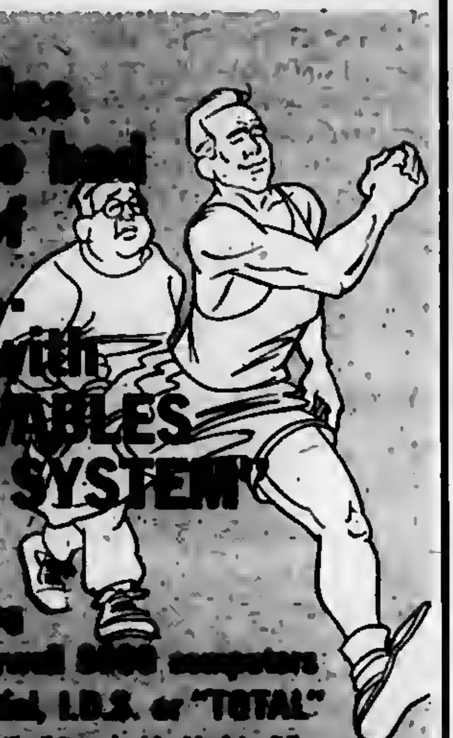

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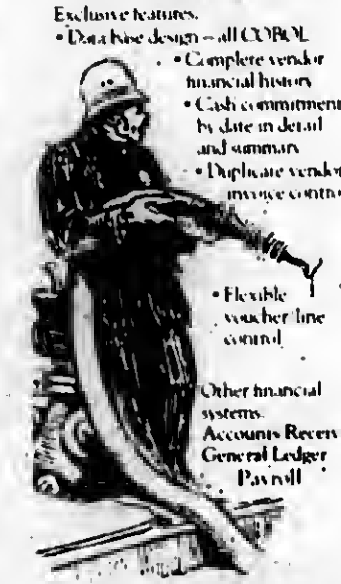

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Information Terminals has obtained a $2.1 million revolving line of credit from Bank of America as well as a lease line of $210,000 for purchases of manufacturing and test equipment.

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IBM declared a regular quarterly dividend of $1.75 per share payable June 10 to stockholders of record May 12.

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Tratec, Inc. will pay its first cash dividend of 6 cents a share June 25 to stockholders of record May 13.

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Itel Corp. will pay 5 cents a share May 28 to stockholders of record May 7.

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North American Corp. of New York has agreed to buy $5 million of General Computer/Systems, Inc. equipment as it is placed on noncancellable 18- to 36-month leases.

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Datapoint Corp. President H.E. O'Kelley indicated he expects third-quarter earnings to be 110% to 120% ahead of those of the same period last year.

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Greyhound Corp. plans to acquire the 16% of the shares of Greyhound Computer Corp. it doesn't hold. If accomplished through an exchange of stock, the unit will be merged into a new subsidiary.

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Decision Data Computer Corp. President Loren A. Schultz expects a "substantial loss" for 1975. Year-end results have been delayed because of difficulties stemming from litigation with International Engineering Ltd., its former European manufacturing affiliate, and from reconciliation of certain equipment leasing transactions.

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Informatics, Inc.'s 1975 revenues rose 19% to $39.4 million from $33.1 million in 1974.

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Pertec Corp. now has a revolving line of credit up to $37 million through Sept. 30, 1979. The firm is changing its fiscal year from June 25, 1976 to March 26. The new date will distinguish the impact of the acquisition of Computer Machinery Corp.

$ $ $

Mohawk Data Sciences Corp. has extended for the second time the date for its offer to swap the $550 principal amount of new 12% convertible subordinated debentures, due 1989, for each $1,000 principal amount of its 5.5% convertible subordinated debentures due Dec. 15, 1994.

$ $ $

Data Dimensions, Inc. netted a $190,000 gain from the sale of its portfolio of IBM 360 equipment during the first half of 1976. Part of the gain will be deferred.

DEC Results Climb 63% in Nine Months

MAYNARD, Mass. – Digital Equipment Corp. turned in record sales and earnings for the third quarter and nine months as earnings climbed 67% and 63% respectively over those in the comparable year-ago periods.

During the third quarter, operating revenues rose 42% to $191.2 million compared with $134.6 million in the same period last year.

Service and other revenues accounted for $39.3 million of the total, up 41% over the $27.9 million reported in the year-ago quarter.

Earnings totaled $18.9 million or $1.53 a share compared with $11.3 million or 95 cents a share.

For the nine months, DEC's operating revenues rose 35% to $504.3 million compared with $373.2 million in the year-ago period.

Service and other revenues amounted to $105.1 million, up 49% over the $70.5 million in last year's nine months.

Earnings rose to nearly $46.6 million or $3.83 a share compared with $28.6 million or $2.39 a share.

The strong pace of new business in most markets is progressing both in the U.S. and abroad, DEC said.

The firm plans to accelerate its manufacturing plant expansion and increase its workforce, which currently numbers more than 22,900.

Commercial and OEM sales were strong during the period and sales to the industrial market improved, DEC said.

Itel Reaps Best First Quarter Yet With Revenues Growing Nearly 50%

SAN FRANCISCO – Itel Corp. reported the highest first-quarter results in its history for the three months ended March 31.

Earnings totaled a record $2.7 million or 34 cents a share compared with $2.1 million or 22 cents a share in the year-ago period.

Revenues for the quarter also reached record levels, totaling $56.1 million, an increase of nearly 50% over the $38.2 million reported for the comparable 1975 period.

"Itel's strong first-quarter results are indicative of the record performance which our company expects to achieve for the year as a whole," according to Peter S. Redfield, Itel president.

"This is attributable mainly to the continuing improvement in world trade and the growing recovery of demand for the leveraged leasing of capital equipment," he said.

"For the first three months of 1976, all of Itel's operating groups achieved stable or improving performances relative to last year at this time," Redfield stated.

Sees Record Year

In all, Itel should have another record year with per-share earnings increasing more rapidly than operating gains because of some restructuring of the company which took place last year, he said.

Revenues from on-line services accounted for about 25% of revenues from Itel's Data Services Group during 1975 and Redfield said he expects this proportion to continue to increase.

Modcomp Net Dips in Quarter

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc. (Modcomp) cut its first-quarter earnings by almost half compared with the year-ago figures.

"The decline in earnings for the period was due to a planned increase in expenditures, particularly in the areas of sales and support, including the related overhead functions, investments we felt were essential to enable Modcomp to achieve the growth we anticipate during the second half of 1976," according to the firm's president, Kenneth G. Harple.

ECS Impact

Expenses to be incurred by Modcomp as a result of its impending acquisition of ECS Information Systems, a supplier of turnkey computer systems for small business applications, will slightly impact earnings during the second and third quarters, he added.

"We expect Modcomp's efforts in the business systems marketplace will become profitable during the fourth quarter," Harple said.

Earnings dropped to $280,000 or 10 cents a share during the quarter compared with $548,000 or 19 cents a share in the same period last year.

Revenues rose to $9.8 million compared with nearly $8.7 million in the year-ago quarter.

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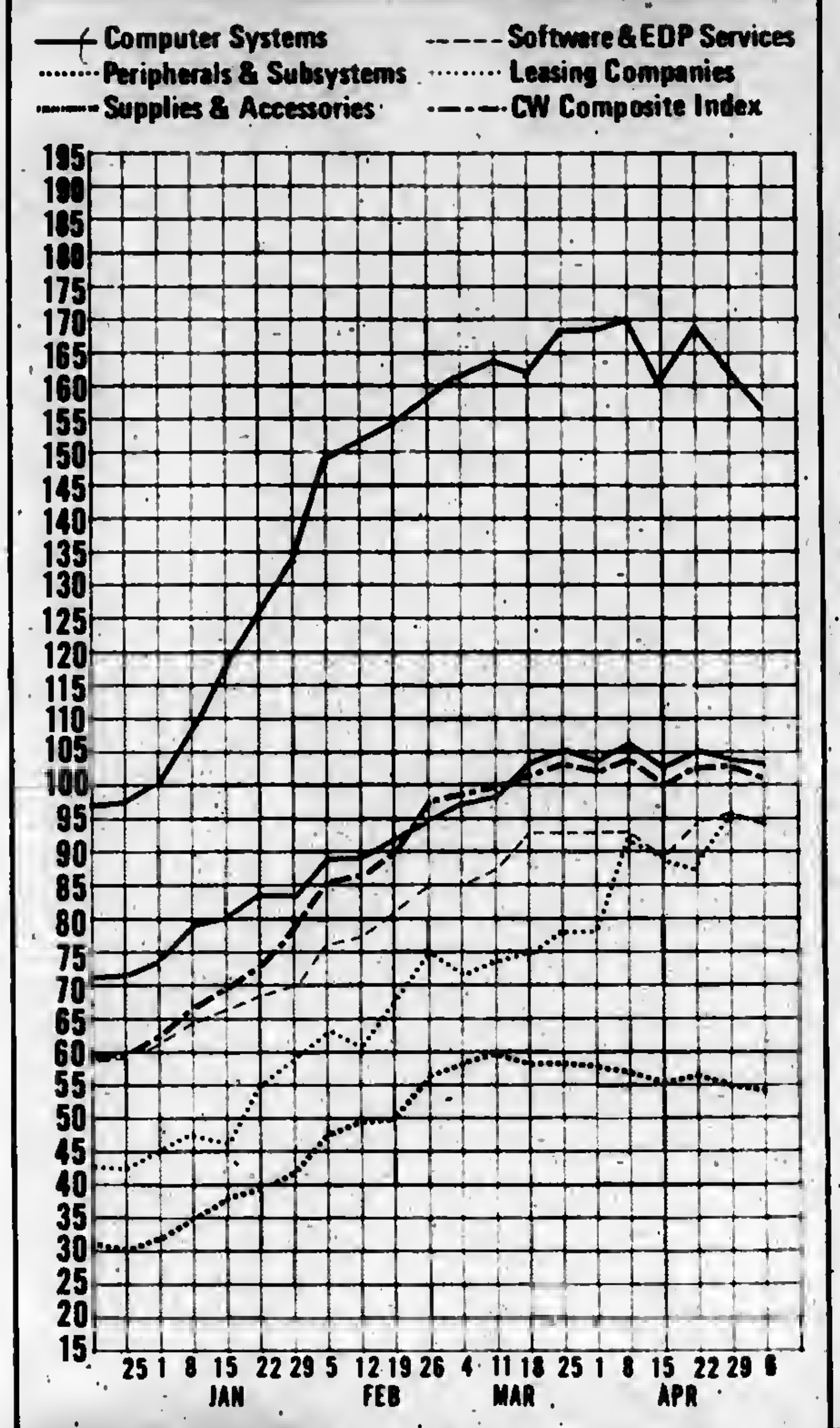

Earnings Reports

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Three Months Ended Dec. 31

	1975	a1974
Shr Ernd	$.46	.....
Revenue	7,925,508	$7,679,233
Earnings	994,239	(759,033)
9 Mo Shr	.95	.....
Revenue	22,265,464	22,174,962
Earnings	2,066,662	(1,922,735)

a-Restated to reflect change in accounting for foreign currency translation.

MSI DATA

Three Months Ended Dec. 27

	1975	a1974
Shr Ernd	.....	$.24
Revanue	$7,682,862	9,352,583
Disc Op	.....	(176,661)
Earnings	2,663	472,042
9 Mo Shr	.....	.62
Revenua	23,310,556	25,186,520
Disc Op	(1,564,354)	(605,694)
Spec Cred	.....	b99,985
Earnings	(1,119,409)	1,214,292

a-Restated to reflect discontinued operations. b-Cumulativa effect of accounting change.

PRIME COMPUTER

Year Ended Dec. 31

	1975	1974
Shr.Ernd	$.34	.....
Revenue	11,387,000	$6,530,000
Tax Cred	370,000	9,000
Earnings	692,000	(532,000)
3 Mo Shr	.14	.01
Ravenue	3,477,000	2,077,000
Tax Cred	158,000	(33,000)
Earnings	261,000	14,000

TALLY

Year Ended Dec. 28

	1975	1974
Shr Ernd	$.43	$.01
Ravenue	21,523,000	17,794,000
Tax Cred	412,000	23,000
Earnings	1,017,000	33,000
3 Mo Shr	.20	.....
Ravenue	6,216,000	4,836,000
Tax Cred	274,000	20,000
Earnings	479,000	(78,000)

GRAPHIC CONTROLS

Year Ended Dec. 31

	1975	1974
Shr Ernd	$2.94	$2.30
Revenue	41,522,000	40,780,000
Earnings	a2,702,000	1,901,000

a-Includes $353,000 from sale of investments.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 5, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE MAY 5 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	101 7/8	-3 1/2	-3.3
O	COMPUTER AUTOMATION	2- 19	16 3/8	- 1/4	-1.5
N	CONTROL DATA CORP	11- 27	21 3/4	-1	-4.3
N	DATA GENERAL CORP	10- 60	53 1/4	-4 1/4	-7.3
O	DATAPOINT CORP	6- 41	35 1/2	- 1/2	-1.2
O	DIGITAL COMP CONTROL	1- 4	3 3/8	0	0.0
N	DIGITAL EQUIPMENT	46-181	166 3/4	-11 1/2	-6.4
N	ELECTRONIC ASSOC.	2- 5	3 1/4	- 5/8	-16.1
A	ELECTRONIC ENGINEER.	5- 16	14 5/8	- 1/4	-1.6
N	FOXBORO	23- 42	39	+1 3/4	+4.6
O	GENERAL AUTOMATION	4- 14	9 5/8	- 3/8	-3.7
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	58-120	106 3/8	-4 3/8	-3.9
N	HONEYWELL INC	22- 56	43 3/4	-1 1/2	-3.3
N	IBM	159-272	259	-6	-2.3
O	MANAGEMENT ASSIST	1- 3	2 1/8	0	0.0
O	MEMOREX	1- 33	29	-2	-6.4
O	MICRODATA CORP	2- 26	20 1/2	-1 1/4	-5.7
O	MODULAR COMPUTER SYS	5- 19	9 1/4	- 1/4	-2.6
N	NCR	15- 35	26 3/4	+ 3/8	+1.4
O	PRIME COMPUTER INC	2- 11	9 1/4	- 1/4	-2.6
N	PERKIN-ELMER	16- 30	20 1/4	-1 1/8	-5.2
N	RAYTHEON CO	26- 59	51 1/8	-1 3/8	-2.6
N	SPERRY RAND	26- 50	47 5/8	- 3/8	-0.7
O	SYCOR INC	5- 31	24 1/2	-2 1/2	-9.2
A	SYSTEMS ENG. LABS	1- 10	8 1/2	- 3/8	-4.2
N	VARIAN ASSOCIATES	7- 18	14 1/4	- 3/4	-5.0
A	WANG LABS.	7- 20	13 1/8	- 1/4	-1.8

LEASING COMPANIES

EXCH		1975-76 RANGE (1)	CLOSE MAY 5 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 10	7 3/4	- 3/4	-8.8
A	COMMERCE GROUP CORP	2- 4	2 3/4	- 1/8	-4.3
A	COMPUTER INVSTRS GRP	1- 3	1 7/8	+ 1/8	+7.1
N	DATRONIC RENTAL	0- 1	3/4	0	0.0
A	DCL INC	0- 1	3/4	+	+8.3
N	DPF INC	3- 7	6	0	0.0
O	EDP RESOURCES	1- 2	1	0	0.0
A	GREYHOUND COMPUTER	2- 7	7 1/8	- 1/8	-1.7
N	ITEL	3- 13	11 3/8	- 1/2	-4.2
N	LEASCO CORP	4- 14	12 1/2	+ 3/8	+3.0
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPG INC	0- 4	3/4	- 1/8	-14.2
A	PIONEER TEX CORP	2- 8	7 5/8	+ 1/4	+3.3
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10	-1	-9.1

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID.
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1975-76 RANGE (1)	CLOSE MAY 5 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/2	+ 1/8	+9.0
A	APPLIED DATA RES.	1- 10	2 7/8	0	0.0
N	AUTOMATIC DATA PROC	29- 67	61 5/8	-4 7/8	-7.3
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	3 7/8	- 1/4	-6.0
O	COMPUTER DIMENSIONS	2- 7	4 7/8	-1 1/8	-18.7
O	COMP ELECTION SYSTMS	3- 9	7 1/2	- 3/4	-9.0
O	COMPUTER HORIZONS	1- 1	1 3/4	0	0.0
O	COMPUTER NETWORK	1- 6	5 3/8	0	0.0
N	COMPUTER SCIENCES	2- 8	6 1/4	- 3/8	-5.6
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 6	3 5/8	0	0.0
O	COMSHARE	2- 7	6 1/4	- 1/4	-3.8
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	14 3/8	+1 7/8	+15.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 3	3 1/8	0	0.0
O	KEYDATA CORP	2- 5	2 3/4	- 1/8	-4.3
O	LOGICON	3- 5	4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/2	0	0.0
A	NATIONAL CSS INC	6- 25	19 1/4	-1 1/4	-6.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	19 1/8	- 7/8	-4.3
N	PLANNING RESEARCH	2- 6	3 1/4	- 1/4	-7.1
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 5	2 7/8	- 1/4	-8.0
O	REYNOLDS & REYNOLDS	10- 24	18	+ 1/4	+1.4
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	25	- 1/2	-1.9
A	UPS SYSTEMS	2- 5	3 1/2	- 1/2	-12.5
N	WYLY CORP	2- 7	4 1/4	- 1/2	-10.5

PERIPHERALS & SUBSYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE MAY 5 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	9	- 3/8	-4.0
O	ADVANCED MEMORY SYS	1- 10	6 7/8	- 3/4	-9.8
N	AMPEX CORP	3- 8	7 1/4	+ 1/4	+3.5
O	ANDERSON JACOBSON	1- 4	3 1/8	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 6	5 1/4	0	0.0
A	BOLT.BERANEK & NEW	5- 13	7 7/8	+ 1/8	+1.6
N	BUNKER-RAMO	4- 8	5 1/2	- 1/4	-4.3
A	CALCOMP	3- 7	4 1/2	0	0.0
O	CAMBRIDGE MEMORIES	1- 6	3 7/8	- 1/2	-11.4
N	CENTRONICS DATA COMP	7- 36	34 1/2	- 5/8	-1.7
O	CODEX CORP	15- 42	33 1/2	0	0.0
O	COGNITRONICS	1- 2	1	0	0.0
O	COMPUTER COMMUN.	1- 5	4 7/8	0	0.0
O	COMPUTER CONSOLES	3- 7	5 1/2	- 1/2	-8.3
A	COMPUTER EQUIPMENT	1- 3	2	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	1 1/4	- 1/4	-16.6
O	COMTEN	2- 9	7 7/8	+ 1/8	+1.6
N	CONRAC CORP	12- 30	23 1/2	- 1/8	-0.5
O	DATA ACCESS SYSTEMS	1- 3	3 1/4	+ 1/4	+8.3
O	DATA 100	5- 16	9 3/8	-1 1/4	-11.7
A	DATA PRODUCTS CORP	2- 11	9 7/8	- 1/2	-4.8
O	DATA TECHNOLOGY	1- 3	1 3/4	0	0.0
O	DATUM INC	1- 2	2	+ 1/4	+14.2
O	DECISION DATA COMPUT	2- 7	2 1/8	+ 1/8	+6.2
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
O	DI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 3/4	0	0.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	- 1/4	-20.0
N	HAZELTINE CORP	3- 12	8 3/8	- 3/8	-4.2
N	HARRIS CORP	18- 47	44 1/8	0	0.0
A	INCOTERM CORP	3- 20	13 3/4	- 5/8	-4.3
O	INFOREX INC	2- 7	5 1/4	- 1/8	-2.3
O	INFORMATION INTL INC	8- 18	14 1/8	+ 7/8	+6.2
O	INTEL CORP	21-109	71	-2	-2.7
A	LUNDY ELECTRONICS	3- 7	4 3/4	- 1/8	-2.5
O	MSI DATA CORP	3- 10	6 3/8	+ 1/4	+4.0
A	MILGO ELECTRONICS	8- 24	17 5/8	+1 3/4	+11.0
N	MOHAWK DATA SCI	1- 7	5 1/8	- 1/4	-4.6
O	OPTICAL SCANNING	1- 3	1/2	0	0.0
O	PENRIL CORP	1- 2	2 1/2	0	0.0
A	PERTEC CORP	2- 8	6	- 1/4	-4.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	9- 10	7	-2	-22.2
O	QUANTOR CORP	2- 6	4 7/8	+ 1/4	+5.4
O	RECOGNITION EQUIP	2- 11	9	- 1/4	-2.7
N	SANDERS ASSOCIATES	3- 11	10	- 1/8	-1.2
O	SCAN DATA	1- 4	2 1/4	- 1/4	-10.0
O	STORAGE TECHNOLOGY	6- 17	19 5/8	0	0.0
O	T BAR INC	3- 10	6 3/4	+ 3/8	+5.8
O	TALLY CORP.	1- 6	4 5/8	- 1/8	-2.6
O	TEC INC	1- 5	4 1/4	- 1/4	-5.5
N	TEKTRONIX INC	18- 60	57	-1 5/8	-2.7
N	TELEX	1- 5	3 1/2	- 1/8	-3.4
O	WANGCO INC	4- 22	16 1/2	-1	-5.7
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975-76 RANGE (1)	CLOSE MAY 5 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 3/8	- 1/8	-3.5
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 10	8 3/8	0	0.0
O	CYBERMATICS INC	0- 1	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	36 1/2	- 1/4	-0.6
O	DUPLEX PRODUCTS INC	12- 25	18	- 3/8	-2.0
N	ENNIS BUS. FORMS	5- 8	6 5/8	0	0.0
O	GRAHAM MAGNETICS	5- 13	8 1/2	-2 3/4	-24.4
O	GRAPHIC CONTROLS	8- 21	18 1/4	0	0.0
N	3M COMPANY	43- 68	59	-3 3/8	-5.4
O	MOORE CORP LTD	39- 51	47 1/2	- 1/4	-0.5
N	NASHUA CORP	9- 22	16 1/2	+ 5/8	+3.9
O	STANDARD REGISTER	11- 20	16 1/4	0	0.0
O	TAB PRODUCTS CO	4- 8	7 1/4	+ 1/4	+3.5
N	UARCO	17- 28	23	-1	-4.1
O	VANIER GRAPHICS CORP	4- 8	6 3/4	0	0.0
A	WABASH MAGNETICS	3- 8	6 3/4	+ 1/8	+1.8
N	WALLACE BUS FORMS	15- 25	22 7/8	+ 5/8	+2.8

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NEWSPAPER

Unchecked Government Output Costs Millions

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – Government computer applications routinely churn out checks, pay bills and make requisitions for more than $40 billion annually – and no one seems to be checking that the output is correct.

At least that's the conclusion of a report the General Accounting Office (GAO) recently submitted to Congress.

While the agency did not quantify the dollar amount that errors in such applications cost the taxpayer, it indicated they run into the "tens of millions of dollars" each year.

"Federal agency computers cause more than 1.7 billion payments and other actions a year without anybody reviewing or evaluating whether they are correct," the GAO report stated.

These payments can be wrong because of both software problems and poor data quality, the report noted.

"Computer actions are only as good as the computer programs (or software) that make the computers operate and the data within the system," the GAO said, adding that "computers can cause incorrect actions if these factors are wrong.

"The result is overpayments and unnecessary or premature costs," the agency added.

Coins New Term

Coining a phrase to cover these routine applications, the GAO called them "automated decisionmaking applications" and defined the term as "computer programs that initiate action (through output) on the basis of programmable decisionmaking criteria established by management and incorporated in computer instruction.

(Continued on Page 5)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper   Second-class postage paid at Boston, Mass., and additional mailing offices   © 1976 by Computerworld, Inc.
Price: $15/year   May 17, 1976   Vol. X, No. 20

IBM Decries Justice's Use of FBI as 'Coercive'

By Nancy French
And Edith Holmes
Of the CW Staff

NEW YORK – The government's use of the Federal Bureau of Investigation (FBI) to interview people who will be called as witnesses by IBM in the current antitrust trial is "coercive," "unconstitutional" and an abuse of government power.

So charged IBM's lead attorney in a recent closed-door meeting with Judge David N. Edelstein, who is hearing the case.

In fact, Thomas D. Barr said, the use of the FBI by the government "impinges on IBM's fundamental right to a fair trial," and he picked up impressive support from two former U.S. Attorneys General during the resulting donnybrook (see related story on Page 3).

In the closed-door meeting with Edelstein and in papers filed afterward, the government stated it intends to go forward with the interviews unless required by the court to suspend them.

Raymond M. Carlson, the government's lead attorney, defended the use of FBI agents in the case as "normal and customary" and accused IBM attorneys of seizing the issue as a means of "continuing its effort to make it difficult for the government to try the case in an orderly fashion."

Requesting FBI agents to interview witnesses is "the most efficient use of facilities and manpower available to us," Carlson said.

"In my 27 years of litigation of this kind, at least two-thirds of such interviews have been conducted in whole or in part by FBI agents," he added.

FBI agents, who are largely lawyers or accountants, are "skilled and discreet" in conducting interviews and investigations; they have been doing that kind of support work for the Justice Department's Antitrust Division as well as its Criminal Division for many, many years, the government attorney said.

Carlson, who described the U.S. vs. IBM antitrust case as "protracted" and a "drain on the public resources," said his staff cannot do without the FBI agents' assistance, and any interference with their use would be tantamount to "tying the

(Continued on Page 4)

U.S. Halts FBI Use Until Edelstein Rules On Constitutionality

By Edith Holmes
Of the CW Staff

NEW YORK – The U.S. government agreed late last week to temporarily suspend its use of Federal Bureau of Investigation (FBI) agents to interview IBM witnesses until the district court judge hearing the U.S. vs. IBM antitrust case here can decide on the constitutionality of employing the FBI in this way.

The Department of Justice, which is prosecuting the government's case, entered into a voluntary stipulation with IBM to halt the interviews begun at the end of April with the understanding that IBM's attorneys will not seek intermediate appeal of Judge David N. Edelstein's decision if it permits the government to continue to use the FBI.

IBM counsel also agreed the corporation would not block a government appeal should Edelstein decide the use of FBI agents to interview trial witnesses is unconstitutional and a violation of IBM's right to a fair trial.

For his part, the judge pledged to the parties he will reach a decision on the matter within seven days after he has the government's papers answering IBM's motion to put an end to the practice.

At last report, the government expected to have its papers before Edelstein by tomorrow.

CW Photos by R. Frank

The Central Maine Power Co.'s DP shop was caught in the middle last week when two bombs wrecked a room on the floor above it (top photo) and a room on the floor below it. The shop itself (bottom photo) suffered only "shock damage."

Two Bombs Rock Maine Utility

By Ronald A. Frank
Of the CW Staff

AUGUSTA, Maine – Two powerful explosive devices were detonated on floors above and below the DP center of the Central Maine Power Co. (CMP) here last week, but the computer installation remained intact.

The bombs contained sophisticated timing and ignition mechanisms; the closest device exploded "within 50 feet" of the utility firm's DP center, according to officials from the Federal Bureau of Investigation (FBI).

Even if the installation had been knocked out, DP operations could have continued by utilizing backup plans, according to Raymond Pelletier, CMP DP manager.

In addition to storing its data files at an alternate location, the company has made

(Continued on Page 6)

FCC Bureau Chief Hits AT&T Lobbying Effort As 'Highly Distorted'

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T lobbying has given members of Congress an unbalanced picture of the intent of the Consumer Communications Reform Act of 1976, according to Walter Hinchman, chief of the Federal Communications Commission's (FCC) Common Carrier Bureau.

The lobbying effort "has been highly distorted and, while some of the data that has been presented has superficial appeal, when you look behind that data it is not really solid," Hinchman said in a recent interview.

The AT&T-fostered bill, introduced by Rep. Teno Roncalio (D-Wyo.), would amend the Communications Act of 1934 by severely limiting the FCC's power to authorize the operation of specialized common carriers [CW, March 22].

The FCC is "not going to do any lobbying since we are actually an arm of Congress, but we are going to respond to questions to present information for the record," Hinchman said.

If the proposed legislation comes up for a hearing in Congress, then the FCC will "definitely put on the record what we think the facts are," he said.

The FCC has not exceeded its authority

(Continued on Page 6)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S., $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700.

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Misinterpreted Record Code

Jail Suicide Blamed on Terminal Operator

By Nancy French
Of the CW Staff

YONKERS, N.Y. – The jail suicide of a 20-year-old man there has been blamed largely on a police communications employee who "misinterpreted" a standard National Crime Information Center (NCIC) computer code.

But three other factors also contributed to the youth's death – insufficient training of police communications employees, an improperly canceled warrant and NCIC's practice of retaining cleared warrants in its data base, according to Eugene Fox, counsel for the city of Yonkers, and Lt. John Duffy, the police officer who investigated the conduct of the policemen involved.

Steven Karagianis was found dead in his cell one and one-half hours after he was arrested by Yonkers police officers on a warrant for probation violation that had been canceled a month earlier [CW, April 26].

The civilian communications employee on duty in the police station when the youth was arrested was a former Marine Corps teletypewriter operator with only 16 hours of training in communications at the Yonkers Police Department, Duffy said.

The operator read an NCIC record coded "CW" as "Current Wanted" (no such code actually exists) rather than "Cleared Wanted." Instead of checking with superiors who could have helped him, he radioed incorrect information to a police cruiser, the investigation found.

Duffy, who heads the Yonkers Police Department's Internal Affairs Division, explained the sequence of events on the night of the suicide as follows:

At 11:24 p.m., Karagianis was stopped for going through a red light. In accordance with routine procedures, the police officer who stopped him radioed the communications operator for a record check on the automobile and driver.

Using the New York State Police information network, the communications operator requested an "R and All," or "record and all other information," Duffy said. New York State's criminal justice computer had no record on Karagianis, nor did the Department of Motor Vehicles, he added.

The response from NCIC showed an active warrant, however; it was coded "CW," meaning the wanted individual had been apprehended, action had been taken and he was no longer wanted.

Operator Wrong Twice

The communications operator misinterpreted the message and radioed inaccurate information to the cruiser; the patrolmen brought Karagianis in.

Since the youth protested so strenuously that the warrant had been canceled, the operator was instructed to resubmit the inquiry, but the same messages came back.

"He misinterpreted the NCIC message the second time the same way he did the first time," Duffy said.

The improper cancellation of a warrant was also cited in the investigation report.

Karagianis, who had been serving five years' probation for a minor marijuana offense, was picked up a second time last November and charged with violating probation.

He appeared in Westchester County Court in January, at which time the charge was dismissed, and the warrant should have been canceled – not just cleared and left in the NCIC data bank, according to Duffy.

Karagianis' attorney, Jeremiah Gutman, became aware the warrant had not been canceled when police came looking for the youth on March 4. On March 5, the attorney wrote a letter to the Sheriff's Department; records indicate the warrant was cleared but not canceled on March 9.

Rather than sending the clear order to the attention of the Yonkers Police Department, however, the notice was sent as an "all points bulletin," which was overlooked in the yards of generalized teletypewritten messages the Yonkers Police Department receives each day, Duffy found.

When Karagianis was arrested, the police actually had both the warrant and the notice, but the two had not been matched up, according to Fox.

New training classes have begun at the Yonkers Police Department to review all NCIC codes and procedures, according to Duffy, and disciplinary action is expected to be taken against the communications operator.

Death Spurs NCIC Policy Change

WASHINGTON, D.C. – The Federal Bureau of Investigation's National Crime Information Center (NCIC) will purge records on a wanted person from its computerized data bank as soon as the warrant for his arrest is cleared by local law enforcement officials.

That decision came as the direct result of a case in which a 20-year-old Yonkers, N.Y., man committed suicide after being picked up and jailed on a warrant that had been cleared. A communications officer misinterpreted the code on the NCIC record. (See accompanying story.)

According to a notice sent to all NCIC participants, warrants formerly coded "Cleared Wanted" will now be treated the same as canceled warrants to prevent local law enforcement agencies from taking "inappropriate action" on such records.

Canceled warrants have always been purged from the NCIC's data bank immediately; however, warrants that were cleared – nullified by police departments rather than by a judge – were formerly retained for 30 to 60 days.

All "Cleared Wanteds" were purged from the NCIC system late last month; the center has instituted programming changes to purge future "Cleared Wanteds" immediately after they are entered, the spokesman said.

Before the NCIC became a nationwide network, officials thought "Cleared Wanteds" should be temporarily retained in the system to keep local law enforcement agencies up to date on cases they might be investigating, a spokesman said.

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Ex-Top Justice Officials Agree Department's Use of FBI Wrong

By Edith Holmes
Of the CW Staff

NEW YORK – Several former high officials in the Justice Department last week agreed with IBM that the use of Federal Bureau of Investigation (FBI) agents to interview witnesses in an antitrust case is an improper and potentially coercive practice.

Former Attorney General Ramsey Clark (who originally filed the case against IBM) and Nicholas deB. Katzenbach (who is now IBM counsel) and former Deputy Attorney General Warren Christofer all agreed the practice is wrong in affadavits filed with IBM motions.

"American citizens are encouraged to cooperate with agents of the FBI and commonly associate FBI agents with criminal and security investigations," Clark said.

"Those factors, coupled with the stigma that may be associated with the refusal to cooperate, make the use of FBI agents to interrogate a defendant's prospective trial witnesses in a civil case improper.

"For those reasons, I believe it is a misuse of the FBI to ask its agents to conduct such interviews. I did not contemplate it when I commenced this action nor do I condone it now," he added.

When contacted later, Clark said he sympathized with the Justice Department's concern that it is "grossly outmanned" in the case by IBM.

"If the Antitrust Division lacks the resources to adequately prosecute the case, [it] should be provided an additional or special appropriation to move the case forward," Clark said.

However, using FBI resources is not the way to do it, he added.

Katzenbach, who is now chief of IBM's in-house counsel, and Christofer essentially concurred with Clark.

But, Christofer said, "since I did not participate in the day-to-day operations of the Antitrust Division or directly handle its cases, I cannot say categorically that FBI agents have never been so used.

"What I can say is that if such a practice had been brought to my attention, I would have questioned and opposed it because of the potential for coercion which exists when FBI agents interview a defendant's witness in a civil suit," he said.

And Katzenbach said: "Because of the public association with the FBI with criminal investigations and because of the public interest in encouraging cooperation with FBI agents carrying out their investigative responsibilities, I believe that any use of the FBI to interview a defendant's witnesses in a civil case would have raised a policy issue of sufficient magnitude to have been brought to my personal attention or to the attention of my successor, Mr. Clark, and neither of us would have authorized the use of the FBI in such circumstances."

Witnesses Find FBI 'Intimidating'

By Nancy French
Of the CW Staff

Witnesses scheduled to testify on behalf of IBM in the U.S. vs. IBM antitrust suit corroborated the corporation's view that talking with an agent of the Federal Bureau of Investigation (FBI) is at best an "intimidating" experience.

Several witnesses contacted by *Computerworld* last week refused to talk about the matter without the presence of an attorney or without permission to review their remarks before they appeared in print.

One said he had "put off the agent" who contacted him until he could seek advice from his attorney on the matter.

Another, who felt the experience promised to be an uncomfortable one, nevertheless refused to comment about it for the record because of the implications of saying something negative about the FBI.

Melvin F. Bockelman, manager of the Kansas City Police Department's Data Systems Division, was the only witness who would even discuss the matter.

Bockelman, who is well aware of his rights, was "slighfly" acquainted with FBI Agent Robert Harmon who called on him in connection with the case, he said.

Bockelman said he spent about two and a half hours with Harmon and "answered what I felt like answering and didn't answer what I didn't feel like answering.

"It was completely voluntary," he said, "just like when the IBM attorneys were here."

Some of the questions Harmon asked would have taken a lot of research to answer, and Bockelman said he didn't have time to do it.

Observers Call Furor Tempest in a Teapot

NEW YORK – Several observers at U.S. vs. IBM here last week saw the furor that developed over the Justice Department's use of Federal Bureau of Investigation (FBI) agents to interview IBM witnesses as the proverbial tempest in a teapot.

FBI agents were used early in the case to take depositions from witnesses without any protest from IBM, one observer said. After reading those depositions, IBM should be glad FBI agents – rather than antitrust attorneys – were being assigned to question witnesses, he said.

Bureau agents, whose familiarity with the case as well as antitrust theory is limited, "don't know how to ask the right follow-up questions" and therefore extract virtually "harmless" information from the witnesses, he explained.

IBM has been able to turn "the FBI's misdeeds" to its own advantage, another observer said, pointing out the mainframer's staff of expert public relations people wasted no time in getting testimony from the first robing-room conference into the hands of the press.

The issue of the constitutionality of using bureau agents to interview IBM's trial witnesses has served to expose the enmity between the parties that has existed since the days of discovery, another observer said.

Early last week, an IBM attorney standing beneath one of the courtroom's hanging lamps that was buzzing in prelude to burning out quipped, "One of the FBI's bugs must be on the blink."

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"The Librarian tells all about the changes and content of our outpatient systems," added Wayne D. Bleckman, Systems Analyst, Outpatient Systems. "If not, we'd have to look at each one of our 98 outpatient programs individually. The Librarian eliminates manual intervention by computer operators by automatically retrieving source statements which are entered into the OS job stream."

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"JCL for DOS is changed, created, and stored on The Librarian," according to Howard Buckholtz of Operations Support. "We create job streams on The Librarian every day. It's automatic for a programmer to use The Librarian on an OS system. It replaces all card decks. There's no need for card readers and punches. We really save hundreds of dollars every month by not having to lease readers and punches."

"The Librarian is just plain fundamental housekeeping," said Francine Schotiald, Project Supervisor. "I can't imagine anyone not having it."

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Charges Abuse of Power

IBM Protests Use of FBI to Interview Its Witnesses

(Continued from Page 1)

government's hands."

Interviews with several officials both within the FBI and the Justice Department confirmed using special agents to interview defendants' witnesses was customary.

Bruce Wilson, U.S. Deputy Assistant General, called the practice "not unusual." He declined, however, to name any other cases in which FBI agents had been used in this manner, but said he knew of "at least 20 others."

Another Justice Department official who asked not to be identified pointed out that Antitrust Division attorneys would rather interview defendants' witnesses themselves. However, in a case as large as U.S. vs. IBM, the division has no other choice.

IBM has named more than 400 potential witnesses. As a rule, a defendant in an antitrust suit seldom names more than 45, he said.

Ironically, after emphasizing the "routine" nature of the FBI's participation in the case, the Justice Department team turned around and filed a formal motion with the court asking Judge David N. Edelstein for his stamp of approval in light of IBM's objections.

A day later, IBM filed papers opposing the government's action, thus placing before the court the objections its counsel had expressed verbally the day before.

Edelstein denied the government's motion largely on procedural grounds. He stated the government had sought an "advisory opinion" from him which was "neither indicated nor desirable."

At the same time, Edelstein suggested IBM recast the papers it had filed opposing the practice into a formal motion for the court to consider.

The following day, IBM filed papers moving for an order to show case – a procedure demanding Edelstein to rule on the issues as quickly as possible.

In that motion, IBM suggested a decision needed to be reached speedily to prevent further adverse encounters between IBM witnesses and FBI agents.

The defense has asked that the government either stop the practice or impose safeguards on FBI agents to protect the rights of IBM and its witnesses.

In its papers, the government argued it intends to have the FBI interview IBM witnesses who are willing to be interviewed in private and without the presence of IBM counsel. Such interviews are a part of its responsibility to expedite cross-examination, the government said.

In addition to reiterating Carlson's arguments before Edelstein, the papers noted it would be impossible for the 13 lawyers now actively engaged in presenting the goverment's case to travel around the country to prepare the cross-examination of prospective IBM witnesses at the same time.

Attorneys for the defense have stressed they do not question the right of Justice Department lawyers, economists or other paralegal personnel to interview consenting witnesses.

However, they do object to the interrogation of witnesses under "inherently coercive conditions . . . Misuse of FBI agents in this way gives the U.S. government an advantage over the defendant to which it is not entitled under law," IBM said.

Witnesses told defense counsel that FBI agents who contacted them indicated in separate instances that the interviews were court-authorized, that they were approved by the Second Circuit Court of Appeals in New York and that one witness was being contacted by the FBI with IBM's full knowledge and consent.

"We have no reason to believe agents involved intentionally misrepresented the facts. Likewise, we have every reason to believe this type of misinformed but authoritative statement will be continued – the leash is long and the agency's status is impressive," IBM's papers said.

The government's direct case will not be completed for approximately a year, providing more than ample time to interview IBM's witnesses, IBM said.

The IBM papers stated further that use of FBI agents is "unnecessary."

Beyond the 13 attorneys the Justice Department says it has working on this antitrust case, "there are more than 440 lawyers employed by the Antitrust Division and more than 3,000 in the Department of Justice," IBM said.

More than 60 lawyers in the division and the department – apart from Carlson's staff – have already worked on the case.

If the judge will not order the government to stop using the FBI in the case, IBM has asked Edelstein to impose rules for the conduct of FBI agents and the protection of the corporation's trial witnesses.

Among the safeguards sought by IBM are the application of the term "interview" to all communications between FBI agents and IBM witnesses; instructions to agents to inform witnesses about the basis for the interviews and their rights to refuse to be interviewed or have their counsel present; and sanctions assuring information gained in such interviews will be used only for the purpose of this trial and will not be disclosed except at the trial or by order of the court.

DEC 310W Could Prove Bargain To TV Watchers in Boston Area

BOSTON – Area users who tune in WGBH-TV next month might be able to get a Digital Equipment Corp. Datasystem 310W at a price better than DEC's.

For the second year in a row, DEC has donated a minicomputer to the public broadcasting station's annual fund-raising auction. The event will be televised June 4-12.

Last year's donation was a $17,000 small business system that went for a high bid of $14,200.

The 310W, valued at $23,600, is a combination word and data processing system. It features a 16K-word PDP-8/A central processor, dual flexible disk drive, 40 char./sec letter-quality printer and VT-52 CRT.

The system includes the COS 310 operating system, which functions under Dibol, and a turnkey text-editing software package.

A 90-day hardware warranty, two days of on-site word-processing training and two weeks of computer training will be offered with the system, which will be delivered immediately to the highest bidder.

DEC's donation is the largest ever received by any of the 55 public broadcasting stations in the country that raise funds with actions, WGBH said.

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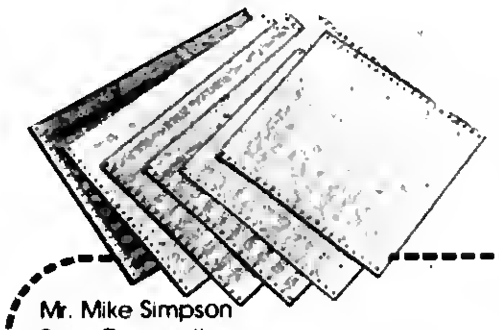

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Examples Show Loss of Taxpayer Money

WASHINGTON, D.C. – In a report to Congress that effectively concluded no one is watching the government store (see story on Page 1), the General Accounting Office (GAO) included several examples.

The examples illustrate software problems "frequently experienced with automated decisionmaking" and data problems which "can adversely affect the actions directed by automated decisionmaking applications," the GAO said.

The examples were not meant as criticism of the agencies involved, the GAO emphasized, but were included to show "these problems can occur wherever these applications are used."

Army Software Problems Waste $2 Million Annually

Over $2 million a year has been spent unnecessarily and a slew of foul-ups have resulted since the Army "improved" the system it uses to supply overseas customers from U.S. depots, according to the GAO report.

The supplies sent to overseas customers come from several Army inventory control plants. Automated decisionmaking applications screen the availability of supplies at these U.S. depots, then direct the computer to produce an order authorizing the more than 100,000 annual shipments.

When the Army decided to enhance this system in the early 1970s, the control points were instructed to design their DP applications so European customers would receive their orders from East Coast depots and Pacific customers from West Coast depots.

In addition, controls were required to prevent the software from releasing cross-country shipments without manual review.

But things didn't quite work out according to plan, the GAO report indicated. The Army Audit Agency examined the applications in effect at five control points and found:

- The software at four of the points could not handle the maximum filling of requisitions from the appropriate depots.
- At one high-volume control point, the software screened stock availability at eight depots before finding the right one during the initial requisition processing.
- Depots on the opposite coast were often selected to fill back orders.
- Controls to prevent the automatic release of supplies from the wrong depots were not implemented at three control points; supplies were automatically released for cross-country shipments.
- At least two control points used software that existed before the criteria for supporting overseas activities were developed.

The unnecessary spending of $900,000 annually was attributed to unnecessary transportation costs. In addition, $1.3 million has been spent on increased inventory investment.

Some VA Beneficiaries Get More Than Their Fair Share

Incomplete data was the cause of $700,000 in overpayments made to some of the 185,000 veterans who receive monthly checks from the Veterans Administration (VA) for apprenticeship or other on-the-job training programs, according to the GAO report.

The VA application was designed to make payments at a rate that decreases every six months; it assumes the veteran's pay increases as he learns his job.

Programmed to read input documents and distinguish training awards from other types of education benefits, the application refers to specific rate tables to determine each veteran's proper payment. The rate tables, in accordance with the system's design, decrease at six-month intervals.

This application authorizes about 1.4 million unreviewed checks for more than $225 million annually. Two types of input documents initiate the payments.

The first type initiates payments to veterans who did not previously receive funds under this benefit program. The second type of document, called a supplemental code sheet, is for the veteran who has already received benefits and is reentering the program, receiving a supplemental award or making a change in key data, such as the number of his dependents.

The data entered on the supplemental code sheet that causes the program to build the scheduled rate reduction is code "77" in a data element called "Change Reason." When VA internal auditors examined 121 supplemental code sheets from 10 different VA locations, however, they found 22 did not contain the "77" code.

Nevertheless, the system had accepted and processed every one of those 121 supplemental code sheets because the software did not contain an edit check to reject documents with incomplete data.

In such cases, the computer used a single rate during the entire training period. The rate was the highest step indicated.

Why did this happen? The GAO said the overpayments caused by processing incomplete documents may have been the result of incompletely trained personnel – and fatigue: "The designer overlooked the edit check, a software problem, in preparing the detailed and complex software."

Unchecked Government Output Cost Millions: GAO

(Continued from Page 1)

"The distinguishing characteristic of these applications, as compared to other computer application programs, is that many of the computers' actions take place without manual review and evaluation," the GAO said.

The use of such systems is enormous in the government, GAO said, adding that at a minimum "government computers issue annually:

- "Unreviewed authorizations for payments or checks (excluding payroll) totaling $26 billion.
- "Unreviewed bills totaling $10 billion.
- "Unreviewed requisitions, shipping orders, repair schedules and disposal orders for material valued at $8 billion."

While there are no governmentwide statistics on such systems, the GAO found 128 operating in just 15 agencies. Out of those, the impact of errors could be as high as $1.7 billion, even though the GAO admitted this would be only a part of the governmentwide total of such applications.

The computer systems in question produce bad decisions "if programmers and analysts make misjudgments or errors in establishing the decisionmaking criteria or if the application is not designed and/or coded in a manner that properly implements the decisionmaking criteria," the GAO said.

There are several reasons the software in such systems can lead to incorrect actions, the GAO report said.

First, the software is often designed with incomplete or erroneous decisionmaking criteria. "Actions have been incorrect," GAO said, "because the decisionmaking logic omitted factors which should have been included.

"In other cases, decisionmaking criteria included in the software were inappropriate, either at the time of design or later, because of changed circumstance."

Another reason for software problems found by the study was the failure to program the software in the manner intended by the user, resulting in logic errors which are often referred to as programming errors.

Finally, programs too often omit "needed edit checks for determining completeness of input data. Critical data elements have been left blank on many input documents and, because no checks were included, the applications processed the transaction with incomplete data."

Data Quality Poor

Besides the problems with the software, "input data quality is frequently a problem," the GAO report found.

"Since much of this data is an integral part of the decisionmaking process, its poor quality can adversely affect the computer-directed actions," the agency added.

Incomplete data is the main problem in this area. "Some input documents prepared by people omitted entries in data elements which were critical to the application, but which were processed anyway," the GAO said.

In other cases, the files in the DP system were not complete or up to date, the GAO said, and the programs were processed anyway.

Incorrect data is sometimes used in automated decisionmaking application processing, GAO added. "People have often unintentionally introduced data into the DP system," and that incorrect data then affected the decisions since no manual review of the output was made.

Finally, "obsolete data used in automated decisionmaking application processing" is often a problem, the GAO found, because updated or new data is not entered into the system when it should be.

DP Protection Topic of Seminar

CHICAGO – Robert H. Courtney, IBM's director of data security and privacy, will head the list of speakers at the Computer/Protection/Insurance Seminar at the Drake Hotel here June 17-18.

The program is cosponsored by *Computerworld* and *Business Insurance* magazine.

Courtney's opening remarks will deal specifically with facilities planning and what top management must know to minimize various risks, according to Edward J. Bride, CW vice-president for editorial services and program cochairman.

Fifteen speakers will address the various aspects of proper planning for computer protection and insurance programs, from the initial stages of site and equipment selection through backup systems and risk analysis.

During a special evening session on June 17, attorney Roy N. Freed will brief attendees on how a properly negotiated contract can be an effective means of obtaining relief from a problem with a computer equipment supplier.

The registration fee is $275 for the first attendee from a company or organization and $250 for the second and succeeding registrants, if the forms are received by June 7. After that date and on-site, the rates increase to $325 and $300.

Information and registration forms are available from Crain Communications, publishers of *Business Insurance*, at 740 Rush St., Chicago, Ill. 60611.

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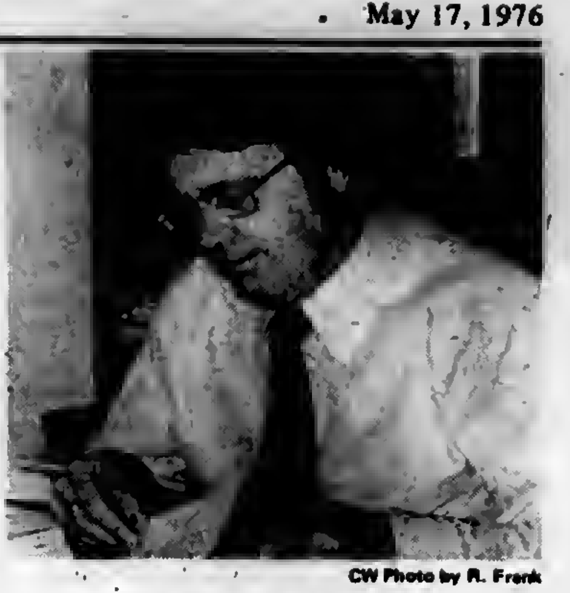

CW Photo by R. Frank

Walter Hinchman

(Continued from Page 1)

under the Communications Act of 1934, as some critics have charged, Hinchman said.

"We certainly don't read the act as having provided any monopoly for all telecommunications services to the carriers. All we have said is that certain markets [specialized carriers and interconnection] don't exhibit the characteristics of a monopoly," he explained.

The longer it takes for the legislation to come up for a hearing, the more "real facts will come out. We have an economic inquiry which we expect will produce results by July, and there are other studies going on in state commissions.

"As the evidence comes out, the more questionable it is going to be whether these services are actually subsidizing basic phone services or the other way around. That is the issue on which this legislation is premised – that this big subsidy will be lost," Hinchman said.

The more facts that come out on this issue, the greater their impact will be, he indicated.

The AT&T lobbying effort is a direct appeal to Congress and the Bell stockholders to get them to express their views, but the general using public has thus far not been concerned with the intent of the proposed legislation, Hinchman said.

Even though some sectors of the telephone industry do not agree with all aspects of the Consumer Communications Reform Act, they have formed a united front to support the legislation, he said.

In the same way, users may not all have similar views about the impact of the bill, but they should sort out some of those differences so they can present a user position to Congress, he suggested.

Turning to issues coming up before the Common Carrier Bureau, Hinchman said the Computer Inquiry will be reopened within the next month.

"We intend this to be a fairly focused inquiry and not like the broad-ranging original inquiry. There were a few areas that were not clear enough; some of these involve changes in technology since then.

"It will be a fairly limited inquiry into a few discrete issues. We may never be able to define precisely the dividing line between communications and data processing, but we hope we can do a sharper job and have fewer exceptions on each side of the barrier," he said.

It may still be necessary, even after the second inquiry, to deal with some issues on a case-by-case basis, he added.

Turning to antitrust matters, Hinchman said the 1956 consent degree between AT&T and the Justice Department may well allow Western Electric, Bell's manufacturing arm, to offer its products on a competitive basis.

"Bell may just have preferred not to offer products through Western Electric, relying instead on the Bell operating companies on a tariff basis. Anything that a subsidiary of Western such as Teletype Corp. can do, Western should also be able to do," he said.

Asked about reports that AT&T really wants Western Electric to become an independent supplier, Hinchman said the Bell System believes deeply it has to have a total integrated operation with manufacturing a part of it.

But the result of the current antitrust suit against AT&T by the Justice Department could well be a divestiture of Western Electric, as the government has asked in the courts, he observed.

Bombs Rock Maine Utility, But DP Center Intact

(Continued from Page 1)

provisions to use other compatible hardware in the area, Pelletier said.

The dual blasts apparently were set by an extremist group calling itself the "Fred Hampton Unit of the Peoples Forces," according to a letter left in the offices of the *Kennebec Journal*, the local daily newspaper.

Despite the force of the two explosions, which were triggered moments apart, no one was injured. "It's damn lucky we're not burying someone today," a CMP employee said afterward.

The bombs caused extensive damage to a maintenance room on the first floor of the CMP headquarters building and an engineering/office section on the third floor. The DP installation is located on the second floor, between the two blast areas.

Asked if those who planted the bombs could have been attempting to destroy the DP center, FBI special agent in charge Richard Bates said it was too early to determine. But, he added, such a sophisticated motive might be giving the extremist group more credit than it deserved.

The CMP computer center definitely suffered "shock damage," according to Pelletier, but hours after the blasts the equipment was checked out and appeared to be in working condition.

The center has four Honeywell mainframes – two H400s, one H200 and a newer 6040, Pelletier said. If the bombs had exploded nearer to the second-floor DP center, they could have crippled the facility, according to CMP president Elwin Thurlow.

The letter delivered to the *Kennebec Journal* said "We the Peoples Force's (sic) claim full responsibility for the booming (sic) of the main office's (sic) of the Central Maine Power Co. in opposition to CMP's exploitation of the people of Maine and thier (sic) ettempt to exhort 20 million dollars from the people by way of rate increase's (sic)."

The letter referred to CMP applications for a rate increase and demanded the company withdraw its application. Hearings on the proposed increase were being held at the nearby Civic Center when the blasts occurred in mid-afternoon.

The letter from the Fred Hampton Unit also demanded that CMP stop further expansion of "nucclear (sic) power in the state" and that the company devote "an equal amount of research itto (sic) solar energy, hydroelectric, and other energy sources."

Asked about the potential seriousness of the demands made in the letter, Bates said, "You have to take this kind of thing seriously when lives are affected."

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Intracompany Memos Cited as Pitfall in Contract Suits

By Nancy French
Of the CW Staff

SAN FRANCISCO – The road to contract litigation against a DP vendor is riddled with legal pitfalls that should be avoided to assure success.

That advice came from three members of the Computer Law Association at the organization's West Coast conference here recently.

Users should "stop writing [intracompany] memos about the contract" because such documents become available to the vendor's attorneys during the discovery phase of the case, George T. Caplan, an attorney with Irell and Manella of Los Angeles warned.

If a memo must be written to build the record, it should be addressed to the user's counsel so it stands a chance of being considered "privileged communication." Privileged communication would not be subject to discovery by the other side, he said.

In one case cited by the legal panel, minutes of a committee meeting were routinely typed up and distributed to those who attended. Unfortunately, the minutes contained details of the company's trial strategy, and with routine discovery the documents found their way into the opponent's hands, seriously damaging the user's case.

A second reason for writing as few memos as possible about the contract dispute is that while such memoranda are intended to preserve the record, they instead "tend to highlight issues that could be damaging to your case," Richard L. Bernacchi, also of Irell and Manella, said.

Give Attorney All Facts

The user should make sure his attorney knows all the facts, Bernacchi said.

To do so, the attorney should have access to people at all levels of the company – top management, middle management and people at the technical level as well. The role a person plays in his company's management determines his perceptions of the problem.

Listening to all these viewpoints assures that the attorney gets an objective view, Bernacchi said.

The difficulty in getting an objective picture is compounded by the fact that "there are no standard definitions in the computer industry." Often one person's understanding of a concept is different from that of another person in the same company.

Attorneys should "probe for precise meanings" to assure they know each person's understanding of the terms being used, panel members said.

"After all, how are you going to get a jury to understand what top-down structured programming is if everyone in the company doesn't?" Bernacchi asked.

Users who have hired an attorney to represent them may also do well to hire an expert to help clarify things further and verify their own conclusions, Caplan said.

The expert should be employed by the attorney, however, so his work will be protected by the "attorney work product" principle, Caplan warned. Otherwise, his work could be subject to discovery.

When all the information has been gathered, the case must be evaluated and a decision made whether to settle or litigate, Bernacchi said.

Even with the strongest of cases, litigation causes a lot of disruption in an operation over a relatively long period of time, he added. Many of the user's staff will have to go to court to give depositions and testify, so the firm must decide whether the monetary rewards are worth the effort.

The lawyers could make "a couple of hundred thousand" in legal fees, and the suing firm might not gain anything, he noted.

Sales Log Good Source

In discovery of the firm to be sued, the user's attorney should not overlook the salesman or his logs as an excellent source of information about the case. The salesman may have written some very damaging things about the system he sold, according to John Chapman, house counsel staff member for California Computer Corp.

The manufacturer's equipment manual is also a source that should not be ignored. The manual would indicate, for example, the number of terminals a system could accommodate.

While the user should have looked at the manual before ordering the system, the manual might show the manufacturer knew the system wouldn't do the job, panel members agreed.

Third, memos written between technical people often contain a lot of admissions the lawyer can't understand, and this is where the expert comes in, they said.

Finally, before any employee who could be important to the case is fired, the user should be sure to notify the attorney, Chapman urged. One disgruntled employee could ruin a user's entire case, he explained.

In addition, the user should plan to appear in court every day, especially in a jury trial, to assure the jury can identify with him in the case – "see how badly he's been treated by the manufacturer," Chapman said.

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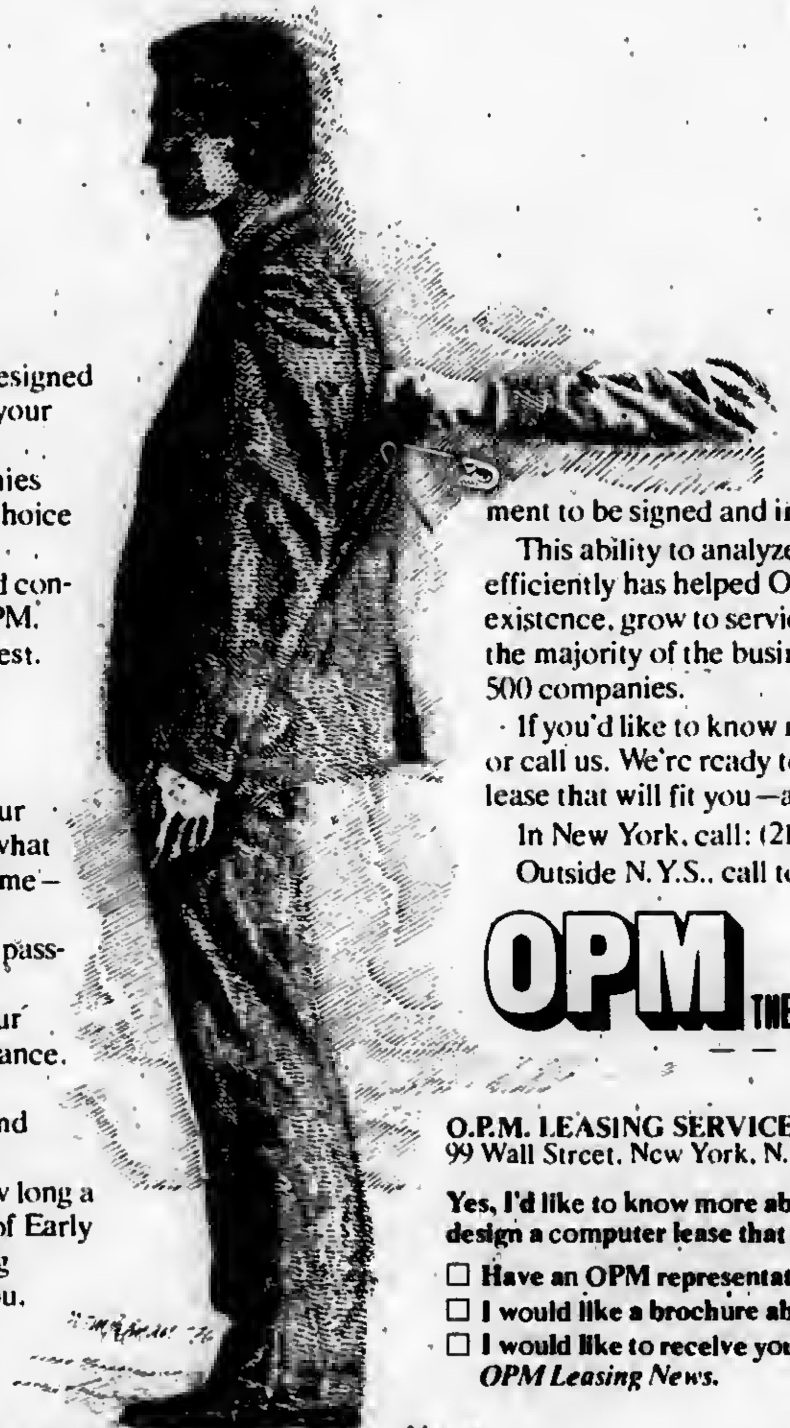

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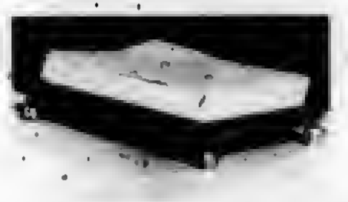

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Calendar

May 20-21, Manchester, N.H. – **The New England NCR Computer Users Groups Spring Meeting.** Contact: Stephen L. Priest, Brockton Hospital, 680 Centre St., Brockton, Mass. 02402.

May 27, Virginia Beach, Va. – **Second Annual Information Processing Exhibition,** sponsored by the Data Processing Management Society. Contact: C. William Smith Jr., Information Systems Administrator, P.O. Box 6191, Virginia Beach, Va. 23456.

May 28, Atlanta – **First Southeastern Region Mumps Users' Group Meeting.** Contact: Mumps User Group, 700 S. Euclid Ave., St. Louis, Mo. 63110.

June 1, Chicago – **Executive Seminar on the Impact of Privacy Legislation,** sponsored by the Data Processing Management Association (DPMA). Contact: DPMA Privacy Seminar, 505 Busse Highway, Park Ridge, Ill. 60068.

June 7-9, Toronto – **American Society for Quality Control (ASQC) 30th Annual Technical Conference.** Contact: ASQC, Department PI-49, 161 W. Wisconsin Ave., Milwaukee, Wis. 53203.

Societies/ User Groups

June 7-10, New York – **National Computer Conference,** sponsored by the American Federation of Information Processing Societies, Inc. (Afips). Contact: Afips, 210 Summit Ave., Montvale, N.J. 07645.

June 7-11, Rochester, N.Y. – **Digital and Optical Image Processing,** sponsored by the Institute of Optics and Department of Electrical Engineering at Rochester University. Contact: The Institute of Optics, University of Rochester, Rochester, N.Y. 14627.

June 8-11, London – **Infofair 76,** an information retrieval exhibition. Contact: F.M. Blake, Brintex Exhibitions Ltd., 178-202 Great Portland St., London W1N 6HN, England.

June 17, Gaithersburg, Md. – **Computer Technology: Directions and Challenges,** sponsored by the Association for Computing Machinery and National Bureau of Standards. Contact: Dr. Robert S. Butler, National Bureau of Standards, A247 Technology Building, Washington, D.C. 20234.

June 21-23, Pittsburgh – **The Sixth Annual International Conference on Fault-Tolerant Computing,** sponsored by the IEEE Computer Society. Contact: Steve Clark, Computer Science Department, Carnegie-Mellon University, Pittsburgh, Pa. 15213.

June 21-25, Denver – **Government Management Information Sciences (GMIS) Annual Conference.** Contact: Joseph M. Lewis, Data Services Division, City and County of Denver, 627 S. Broadway, Denver, Colo. 80209.

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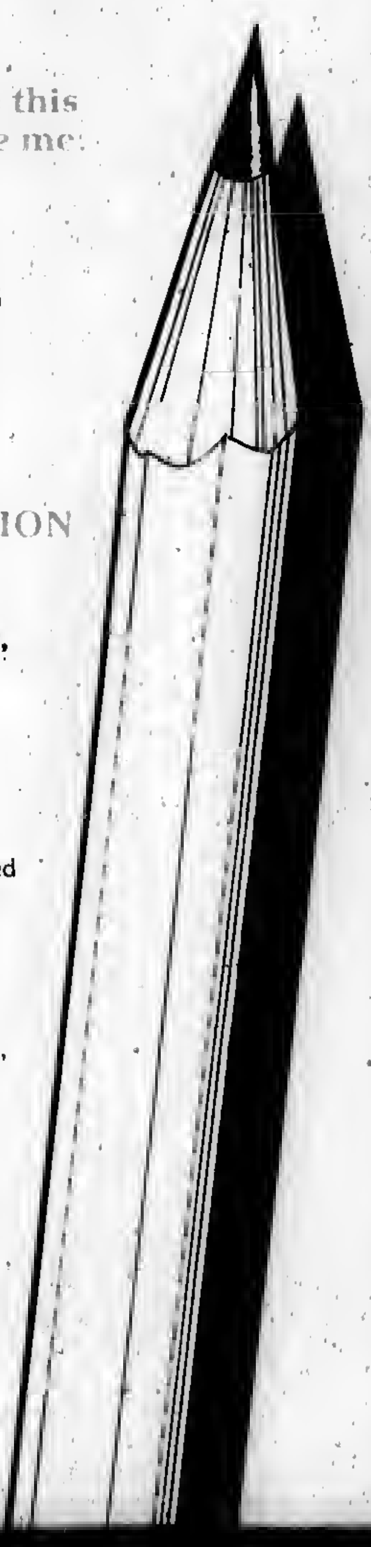

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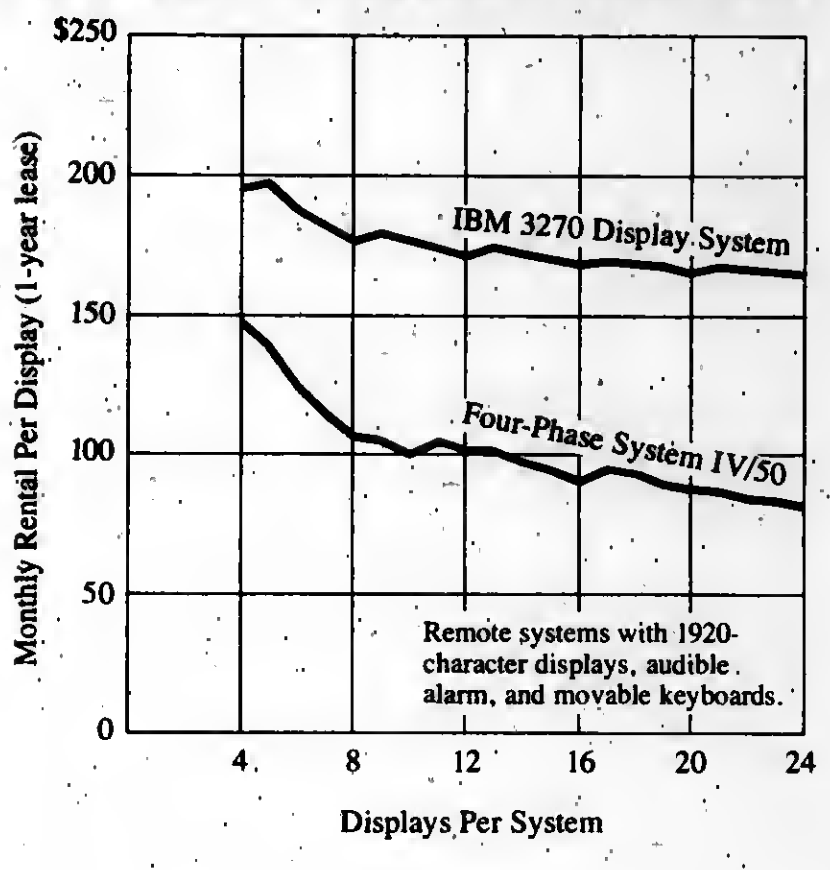

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Minn. Governor OKs Privacy Law's Second Amendment

By Nancy French

Of the CW Staff

ST. PAUL, Minn. – For the second year in a row, Minnesota Gov. Wendell R. Anderson has signed into law an amendment to this state's privacy statute.

The latest amendment:

- Makes criminal justice information "public" as long as the individual is still "within the criminal justice system."
- Confers authority on the Minnesota Legislature to classify all information systems as "private," "public" or "confidential."
- Discontinues the annual report on information systems previously required of all agencies and political subdivisions for review by the Commissioner of Administration.

The amendment, which is becoming law in stages, will be law in toto on June 1. It applies to both automated and manual personal information systems operated by state agencies and political subdivisions within the state.

Under the amendment, arrest information is neither confidential nor private as long as it is "reasonably contemporaneous" with an arrest or incarceration. Thus it is available to the public and the news media.

The term "reasonably contemporaneous" was borrowed from the Law Enforcement Assistance Administration's new guidelines and has been defined as meaning "while the individual is within the criminal justice system," whether he is awaiting trial, in jail or on parole, according to Daniel Magraw, assistant commissioner for administration.

During the time the individual is still in the system, such information would be available through the courts, Magraw said. After the individual has served his sentence and is no longer in the system, those records become confidential and will not be made available to the public in general or employers by the police or the courts, he said.

"In Minnesota, arrest records have not been released to the public for six or seven years," Magraw said, "although in the past it was possible to obtain such information from the local police."

The amendment also established the Legislature as the only body authorized to classify information. All records will be classified by statute by 1977, Magraw said.

Until then, however, the amendment permits state agencies, political subdivisions or statewide systems to apply to the Commissioner of Administration for permission to classify data or types of data for their own use until specific statutes can be enacted.

Before applying for such an emergency classification, however, the law requires an organization to assure no statute exists which allows or forbids classification.

It also requires that organizations show the data on individuals has been treated as either private or confidential by custom of long standing recognized by other state agencies or political subdivisions and the public.

Such an application must also show a compelling need for immediate classification which, if not granted, could adversely affect the public interest or the health, safety, well-being or reputation of the data subject. All such applications are subject to approval by the state Attorney General.

All emergency classifications that have not been formalized by the Legislature by June 30, 1977 will expire that day; no further emergency classifications will be granted beyond that time.

Annual Reports Eliminated

Finally, the amendment eliminated the existing privacy law's provision requiring the state's 1,850 agencies and political subdivisions to file an annual report on their public information systems with the Commissioner of Administration, effective Aug. 1, 1977.

Agencies and political jurisdictions will continue to be required to update their reports, however, and make the documents available to the public within the agency or local community.

The law was passed in the spring of 1974 [CW, May 8, 1974].

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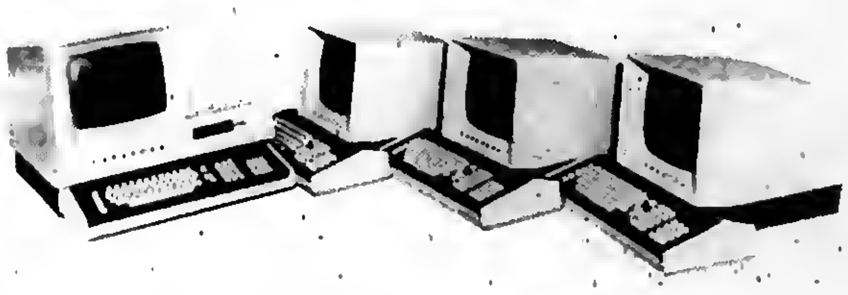

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Calif. Legislator Defends Privacy Bill On Grounds of Limitations, Low Costs

By a CW Staff Writer

SAN FRANCISCO – The proposed California privacy law which covers the private as well as the public sector would create no bureaucratic hierarchies to administer it and would make nothing illegal as long as the public is informed, the assemblyman who introduced the bill said here recently.

The bill, introduced by Assemblyman Mike Cullen (D-Long Beach), was approved by the California Assembly [CW, Feb. 16] and has been referred to the Senate Policy Committee for study and possible further amendment.

The bill will be brought up for vote in the Senate during the last month of the session, Cullen said.

Simple, Low-Cost Bill

Comparing his simple, low-cost bill with the one that passed both houses of the Legislature last year only to be vetoed by Gov. Jerry Brown, Cullen said Brown didn't veto last year's bill because he didn't understand it – "he vetoed it because he did understand its onerous provisions and high costs."

People are searching for ways to protect their right of privacy, and it is the intrusion of computer technology they are most concerned about, he told members of the Computer Law Association.

"In the computer age, privacy, like the bald eagle and the blue whale, was becoming an endangered species," he said.

As evidence, he noted the California constitution was amended to make privacy a constitutional right in this state as long ago as 1972.

Only automated personal information systems are covered under the provisions of Assembly Bill 150, and only in a broad conceptional manner, leaving responsibility for a detailed interpretation up to the courts, Cullen said.

Secondly, he said, the bill is aimed at "informing the people about what is going on – how their records are being used," he said.

Third, "it is the first in the nation to cover both the public and the private sector," he said.

The bill contains a code of fair information practices that allows anyone to establish, change or terminate an automated personal information system as long as he files a public notice indicating its purposes, uses, data categories and routine recipients.

The bill also requires the recordkeeper, when collecting information, to tell the data subject how it will be used and the consequences he may face if he refuses to supply the data, Cullen said.

The data subject may obtain a copy of his record from any organization for a fee of $5 "to discourage" a group from requesting the record of every member, for example, he explained.

In the case of a dispute between the data subject and the recordkeeper, each may file a statement of not more than 100 words that must be kept with the record, he added.

Any personal information may be disclosed upon consent of the data subject and information which is not personally identifiable may be disseminated for statistical research.

State archives, law enforcement officials and state and local government agencies with statutory rights to personal records may obtain them, he said.

The bill would make nothing confidential that is not already confidential, he said, and law enforcement records have been excluded.

Cullen said he has been encouraged by corporate response to the bill. The General Electric Co.'s privacy task force has been studying the bill and said it would cost that company $64,000 to comply – far less than any earlier bills, he said.

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Study Sees Computerized Nations More Vulnerable to War Threats

By Catherine Arnst
Of the CW Staff

STOCKHOLM, Sweden – The wars of the latter half of the 20th Century have tended to break out in underdeveloped, "third-world" nations where automation is still a stranger.

But those nations advanced enough to be submerged in computerization could be even more vulnerable to the threat of war, a study recently released by the Swedish Ministry of Defense contended.

"Computerization presents new and efficient methods for creating chaos and confusion in the community with very little effort," according to the study of Sweden's dependence on computers, titled "The Vulnerable Computer Society."

The Secretariat for National Security and Long-Range Defense Planning, which prepared the study, said the result of increased dependence on DP will be that "many of the peacetime functions in total defense will be so dependent on computers that it will take vast emergency planning and expenditure to ensure defense can fall back on manual routines in the event of war."

It also warned that the interaction between and interdependence of computer systems could mean that "a completely trivial event, such as the failure of one data system, may have far-reaching consequences for large sections of the community."

Although such events can occur in peacetime and still cause considerable problems, "it seems even more reasonable to assume that such events are more likely to take place during periods of what can be loosely termed 'social stress,' " the report said.

'Irreversible Process'

The problem with automating a large number of processes in a society is that "the introduction of computers would seem to be an irreversible process, i.e., it is impossible to return to former production techniques . . . once processes have been computerized.

"Of course, this considerably increases the sensitivity and vulnerability of society to different kinds of upsets," the report said.

The computerization of certain functions would particularly lead to a pronounced heightening of vulnerability, the report said.

These functions include activities previously dominated by labor-intensive techniques requiring the handling of large quantities of data, such as bookkeeping, advanced surveillance and control of complicated courses of events, such as traffic surveillance and control.

The computerized control of production processes in the manufacturing industry and real-time processing, which has made it possible for several users to be in direct contact with the computer via remote terminals, were also cited by the report.

Ideal Targets

Data banks which contain detailed information on a country's population are ideal targets for "a possible aggressor who is trying to gain effective and complete control of the population when engaged in acts of war," the study warned.

Data communications between nations are also extremely vulnerable; facilities for an effective control of the information moving between countries are very limited, it continued.

"International movements of data should be kept under very vigilant surveillance," it urged.

The greatest danger to a computerized society in time of war is its computers, the report emphasized. Not only is it difficult to operate a society dependent on computerization during war, but "it is possible for an aggressor to choose targets so that by spot strikes on DP systems he can achieve both great psychological effects on the entire population and the total disruption of local production and community services.

"Expanding computerization will probably require new and much more comprehensive security measures in order to safeguard the administration of society in the hroadest sense of the term," the study recommended.

Survey Finds Businesses Mixed on Hiring Grads Of Vocational School

By a CW Staff Writer

WARWICK, R.I. – High school seniors studying DP at the Warwick Area Vocational Technical Facility here conducted a survey of area businesses that resulted in a mixed bag of responses on hiring students trained in this manner.

The survey, answered by 112 DP centers, asked employers what they are looking for in the way of training, their assessment of the Warwick program and whether they would hire a student from that program.

The school sponsors a cooperative work program with area businesses, of which 40.17% of the responding companies were familiar.

Only 27.59% of the companies, however, were willing to participate in the program, the survey found.

But 62.50% of the companies did feel a graduate of the vocational school had sufficient knowledge to be considered for a job in the computer area; only 4.46% answered unequivocably "no" to that question.

The level at which these graduates would be hired ranked low in the job hierarchy, however – 70 companies said they would consider hiring the student as either a computer operator trainee or at the keypunch operator level, 47 as a verifier operator and 39 as a programmer trainee.

Biggest Gap

Hands-on experience was most often given as the area in which high school graduates are lacking.

About 53% of the respondents felt the students would have insufficient background in accounting and bookkeeping, 22.3% thought reading comprehension was poor and 25.9% thought students needed more business math and basic arithmetic functions knowledge.

The area of training given the highest priority by employers was documentation procedures, which 52.7% of those responding cited as an area in which they would like to see students trained.

This has prompted the school to change its curriculum to include heavy emphasis on documentation, which Jim Osbaldeston, a computer technology instructor there, said was an area both the survey and his experience indicated was covered too lightly.

One conclusion Osbaldeston reached was there is a feeling in the DP field that the school's program, which is similar to that of Rhode Island Junior College, is "geared too high for high schools students.

"That's not true; we try to give the kids as much as they can handle," he said.

Osbaldeston was not overly disturbed that so many employers were reluctant to hire a student in the program because he considers it a "model program" designed to provide its participants with the basic skills and knowledge necessary for entry into more comprehensive programs at the postsecondary level.

About 90% of the students graduating from the program go on to college, usually majoring in computer science, accounting or business management, he said.

"Employers are reluctant to hire someone straight out of high school," he said, "but I've been successful in placing all students who do want a job. They are usually hired at the trainee or junior level."

Since the survey was concluded, the school has also received more inquiries about its cooperative program, which allows students to gain the experience desired by many employers.

"The problem I've found with employers is not that they're not willing to participate, but that they don't have any slots open. It's rare they say no," Osbaldeston said.

Osbaldeston does not think high school is too early to begin training a student for a career in DP.

"This is the direction where education is going now," he said. "Many more students want to learn a skill at the high school level."

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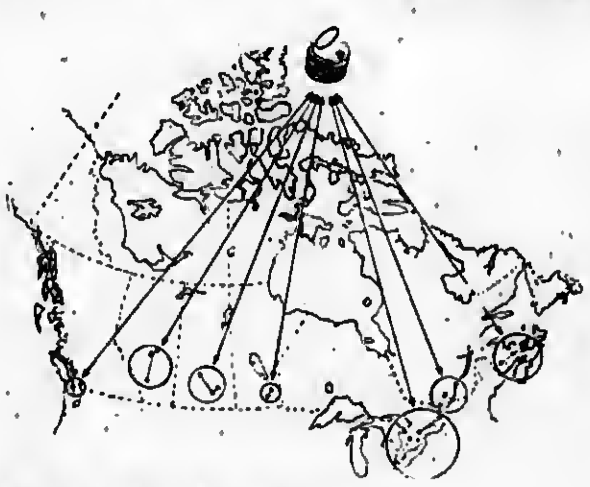

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Editorials

Backing Bell Blindly

It seems to be quite the spring fashion for members of Congress to join up as cosponsors of the AT&T-fostered Consumer Communications Reform Act. At present, more than 60 representatives and about nine senators have joined in endorsing this proposed legislation [CW, March 22].

Some of the legislators have justified their backing of the bill by claiming they welcome an open debate of the issues being raised by the Bell System and its allied telephone companies.

But do these members of Congress understand that this bill – which purports to help the consumer – will actually eliminate two emerging fledgling industries which are struggling to survive in an environment where the established carriers and equipment suppliers reign supreme?

Do they understand that this bill would virtually eliminate federal control over our common carrier telephone network by relegating that control to separate state agencies, each of which would set its own charges for services and its own standards for network operation?

Do they understand that separate state rules and regulations might make it impossible for the nation's businesses to operate their vital coast-to-coast intracorporate communications networks?

Do they understand that the carefully controlled competitive environment fostered by the Federal Communications Commission in the narrowly defined specialized carrier and interconnection areas would no longer experience innovation because it would no longer exist?

Those politicians who choose to put their names and support behind this bill should realize they are helping to block competition, to make phone rates even higher and to create a carrier environment that will stifle the introduction of new services and products businessmen want and need.

A Joint Responsibility

Some groups have an image of DPers as people who are more interested in the machines with which they work than in the people served by the systems.

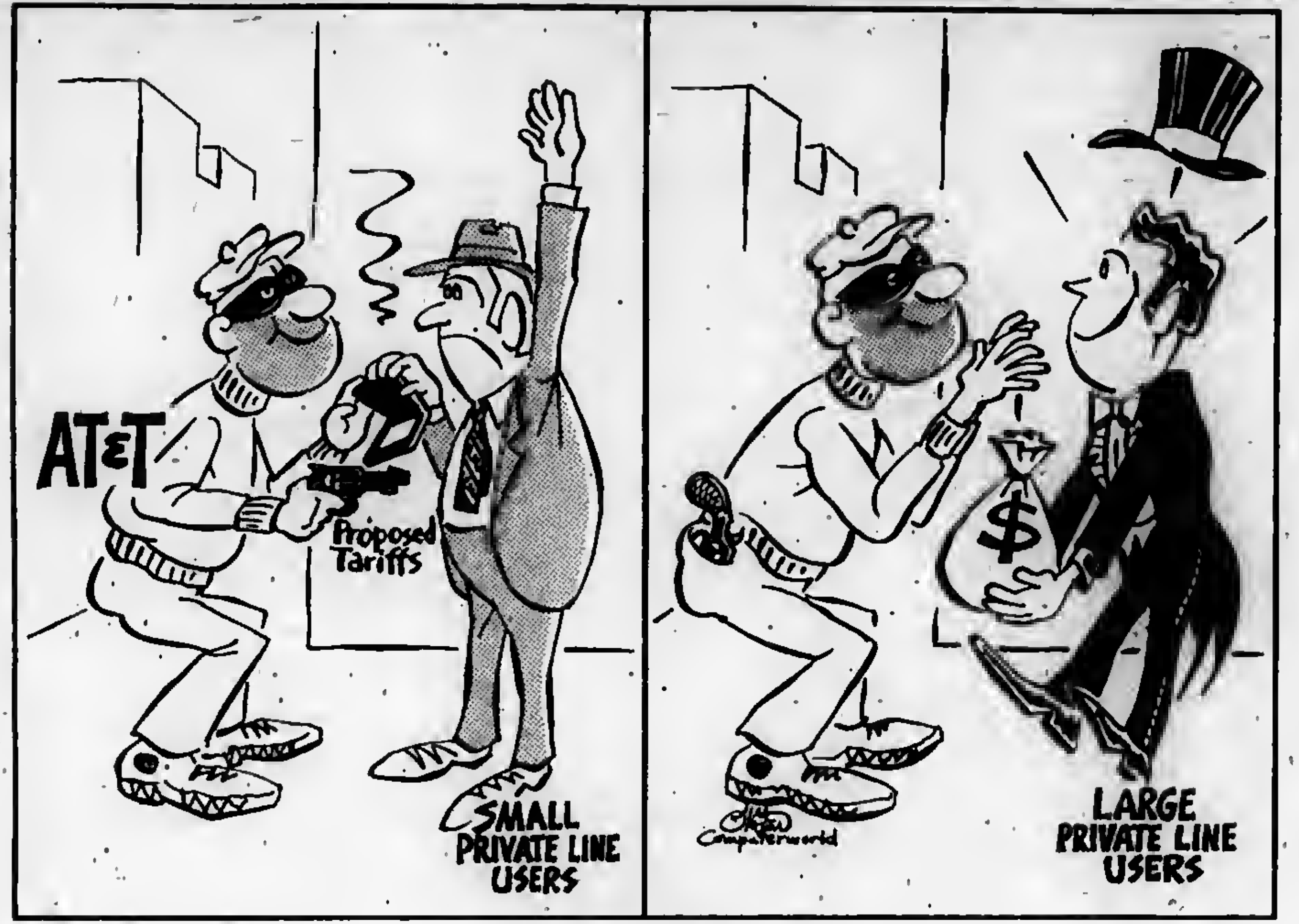
That image is exaggerated, but it is often believed. A case in point is the recent Human Services Information Systems Conference, where a number of attendees complained that those involved with the operational end of systems – such as DPers – tend to ignore the people served by the systems in favor of more efficient systems design.

The goals of efficiency and error-free systems design are important, but in this and in many other areas, those goals often have to take a back seat to the needs of the people affected by the system.

Both DPers and social workers have a responsibility to bridge the gap that is too often apparent in the social services field. The social workers should make it part of their job to understand how automation can help their clients and to translate their clients' needs into language that can be understood by the computer experts.

And the computer experts must spend more time learning about the real needs of people served by the information systems in this area. They should strive to design systems that meet those needs rather than systems that just operate more efficiently.

Perhaps, with such cooperation, the nation may see the beginnings of a welfare system that will not trap its beneficiaries, but help to free them.



Robbing Hood

Letters to the Editor

Grosch Missed the Point

Herb Grosch missed the point of the new triservice programming language DOD-1 [CW, May 3].

Far from being a 10th entry in a field of nine, DOD-1 is a comprehensive and modern language which will have enough control clout behind it to eventually oust most of the pretenders to the universal language crown.

Grosch should have read the requirements spec (called "Tinman") and then made a judgment about DOD and deja vu.

Robert L. Glass

Seattle, Wash.

Take Hard Sell to the Masses

My ignorance may be showing, but I think the DP industry is in its own vacuum when it considers the apparent failure of the Universal Product Code (UPC).

It has been a long time since American industry has consulted the consumers, as the April 19 editorial cartoon indicated. If you were to ask Proctor and Gamble what sold so much Tide over the years, the rapid response would be to throw a copy of *Fortune Magazine* detailing a superbly tuned marketing plan at you.

UPC people need to educate, indoctrinate and otherwise impress consumers with their new toy.

Bring on the billboards, personal testimonies from stars, talk show exposure, magazine ads (*Home and Garden*, not *Datamation*) and last but not least – a Country Western singer that can do for UPC what C.W. McCall did for CB radio!

Generally speaking, few will buy a "pig-in-a-poke," but if Johnny Carson interviewed an industry spokesman about the expenses of price marking and inventory records, some segment of the populace might look forward to seeing those stripes.

Please, someone preserve the technology so I can put it in my warehouse to check orders some day!

Ray Kaplan

Tucson, Ariz.

Ads Show DP's Anti-Women Bias

In the April 26 issue of *Computerworld*, we were again reminded of the blatant and subtle discrimination practices of the computer industry.

The following advertisements ignored the fact that 20% of the professionals in the computer field are women:

- The ad for Prime Computer, Inc. on Pages 22-23
- The ad for Northrop Data Systems on Page 47.
- A second ad for Prime on Page 41, a miniature of Pages 22-23.

It is this kind of insidious, hidden pursuasion that keeps women and other minorities from equal pay and advancement in this field.

Valerie Van Holten
Acting Head
Carol Parsons
Computer Programmer
Anya Shevchenko-Mason
Computer Specialist
Mary Cusano
Computer Specialist
Automated DP Management Section
National Cancer Institute
National Institutes of Health
Bethesda, Md.

'Peopleware' Term Offensive

I wish *Computerworld* would consult its consulting editor, Herb Grosch, and ask him what he thinks of the term "Peopleware."

On my part, every week I read CW I find the term and its implications increasingly offensive.

Gerald M. Weinberg

Lincoln, Neb.

We sympathize with reader Weinberg and welcome suggestions for a more "humane" marker for the articles we run attempting to show that selection, training, motivation and support of people is at least as important as selection, optimization and use of hardware and software if the total DP operation is to be effective and efficient. Ed.

(Other letters on Page 14.)

Data Past

Five Years Ago
May 19, 1971

PARK RIDGE, Ill. – The Certification Council of the Data Processing Management Association abolished academic requirements for the Certificate in Data Processing (CDP) at the council's spring meeting, but increased work experience requirements from three to five years. The council said the cause was significant changes in society – particularly in the educational segment of college curricula, practices and the nature of the degree itself. The changes took effect at the 10th annual CDP exam in 1972.

– – –

SANTA CLARA, Calif. – Computer Synectics, Inc. (CSI) here claimed IBM had illegally changed policies by offering free use of its Systems Measurement Instrument (SMI) and filed a $15 million antitrust suit against IBM to force a return to the price tag. Dudley Werner, CSI president, helped design the SMI computer performance measurement tool before forming his own company in 1969.

Repairing the Damage

It certainly was not my intention to write a whole series of pieces about privacy. The news column of CW and the general and business press are quite full of it, and I ought to be off browsing in other pastures. But the recent Supreme Court action regarding bank records is so important, not just for data processors and do-gooders, but for the man in the street, that I have to return to the issues.

Recently I asked, "Who owns the data?" and predicted that, while banks and credit bureaus and hospitals and school registrars claimed they did, in the long run it would be recognized that every individual owns his own personal data and permits use of that data only for his own advantage, or in a closely limited number of ways, as legally required (taxes, for instance). Well, I hope I'm right – but the day of recognition sure took a mighty hop into future time when the Nixon Supreme Court ruled that bank statements, telephone bills, and the like are not private at all, do not require a subpoena for examination by Uncle Sam's agents, or just about anyone else who is snooping around.

Ugly! And dangerous, not only for civil liberties but for ordinary commercial confidentiality: if an IRS man, why not a cop; if a cop, why not a private investigator – or a crooked or venal minor official. But, although I'm of course not a lawyer and can't read the decision professionally, I suspect the court is correct: there is no constitutional right or legal precedent or even established custom to protect our financial data – or us.

Three levels of remedy are possible. The first, the one we all need desperately, is terribly hard to arrive at and cannot come quickly. That is, new constitutional law, state or federal, which specifically confronts modern and ancient challenges to privacy; a first line of defense against arrogance and greed and Big Brotherism. Sam Ervin has seen the lack, and as the senior constitutional law expert in the Senate, pointed it out back in the Sixties. But as I said, that kind of protection is slow. From the first calls for amendment to enactment and installation would be five years in a Wisconsin or a Minnesota, ten years in a California, or nationwide.

To tide us over until a Great Wall of fundamental law can be built, we need narrower legislation and executive orders. The Congress, legislators in "good" states, and even governors and heads of Federal agencies and departments can protect certain classes of data, certain files and documents, from specific incursions and abuses. If the bank guys in Washington can define the term "branch bank" with one stroke of the ballpoint, and overturn EFTS plans like a bulldozed antheap, why cannot the same people put out regulations that, for a few years at least, will protect my photophobic dollars? And clearly Congress can pass laws far short of Bill of Rights stature, negating much of the Supreme Court thrust. After all, what was claimed was that *existing* law did not reserve financial records from inspection; new law is certainly possible.

I remember also with considerable pleasure that Gov. Sargent of Massachusetts, while I was serving on his *ad hoc* privacy commission, signed an executive order forbidding state employees to disclose or abuse broad classes of personal records. Such abuse did not thereby become illegal; statutory action was to come later. But an employee could be reprimanded, demoted or fired for disobedience; that's a powerful discourager.

Finally, in areas where neither constitutional nor specific laws are erected, there is a real possibility of voluntary (i.e., profit-motivated) protection. I bank with a major California giant, and lesser chains and local banks hanker for new accounts. Let one of the latter offer me *volunteered* privacy – no incursions without subpoena – in such a way that I can sue for breach of contract, and heavy punitive damages, without detailed demonstration of loss. I'll transfer in a minute, and so would lots of others. I honestly believe that voluntary protection offered by commercial outfits, and executive orders in school systems and motor vehicle bureaus and assessors' offices, could plug most of the gaps opened up by the Court. And then, to avoid having them pried open yet again, constitutional protection!

There are inevitably areas between the completely commercial and the entirely government: hospitals, for instance. That would be where special legislation, my second area of action, would be extremely helpful. Suppose state law were to ensure enforceability of wording on all data entry forms where the signer is subject to civil or governmental penalties for misinformation – wording that specified how the data submitted was to be used, wording which would refer to the underlying law, and potential penalties. Properly drawn, such law would establish intentional disclosure as *prima facie* evidence of breach of contract.

No, we aren't helpless. And of course expert lawyers and legislators could think of more powerful tools, better than the above. What we need is recognition of an enormous new threat to individual liberty; the tools to defend it will be forthcoming.

Herb Grosch

Reader Commentary

Standard Format Encourages Accurate Documentation

By Richard Zaneski

Special to Computerworld

Today's expanding computer industry requires accurate and well-written documentation. In most cases, the written word is an afterthought, regarded by many as a luxury. However, as software requirements grow, this luxury becomes a necessity.

Little has been done to develop a standard documentation format in-house over the years. As a result, many DP managers have become frustrated with their existing documentation and the reluctance of staff members to write it.

In the past, efforts were made to generate technical documentation by programming and systems personnel. Not being professional writers, they created unorganized material. Then, after being put in operational use, the documentation was not properly maintained. Eventually it became obsolete and useless.

Other groups recognized the problem and brought in professional nontechnical writers to do the job. Some met with limited success. However, most had little or no programming, systems or computer knowledge. The result was wasted time and a written product that was weak.

With these past experiences in mind, many groups turned to technical writers who specialized in data processing and related fields. This handful of professionals were mindful of the problems facing data processing personnel. Their qualifications were unique and appropriate for the job at hand.

Flexibility Needed

At that time and today, these qualifications include flexibility and a receptiveness to an ever-changing work environment. In addition, versatility and a certain creative flair should supplement a good writing ability and a basic technical awareness.

Three critical areas of programming and systems documentation face technical writers in today's DP community. They are: operating documentation on a program and systems level, related user manuals and actual work procedures used by a data center and its affiliated departments. Each area of writing requires a certain expertise in its preparation and explanation.

Operating documentation can be as detailed as a group desires. This requirement must be determined initially when the basic standards are developed by the technical writer and DP staff.

Also, the programming and systems sections of the operating documentation must be restricted to their areas of use. This precaution provides a certain amount of security that is necessary in today's business world.

Essential program areas that require documentation are as follows:

- Program description.
- Input and output file identification.
- Output report identification.
- Run frequency.
- Program logic narrative with an associated flowchart.
- Amount of core.
- Runtime.
- File use.
- Printer type.
- Carriage tape used.
- Unique forms or reports.
- Console messages and any required action.
- Job control language.
- Control card formats.

This information can be expanded or reduced as the needs of a group dictate. It should be noted that as each set of program documentation is developed, a common link must be established.

For example, if individual program write-ups contain common files, they must use the same file names. Also, the file source and destination must be included to maintain a consistent flow between written operational units.

System documentation, however, can be broader in its approach. It closely parallels those areas listed for program documentation, providing greater detail and more control data. Its function will be to provide a source of reference for DP personnel.

When preparing both types of operating documentation, they should be typed on a standardized page. It is an excellent vehicle which encourages written consistency and greater flexibility. The typed pages must then be placed in protective plastic and numbered binders. This numbering procedure forces personnel to place a volume in its proper place.

In addition, every volume must have a table of contents and list of effective pages, allowing positive control over all written material.

User manuals constitute another vital area. Their complexity is based on a user's needs. However, they should contain enough information to give a user a sound understanding of a system and his related job.

Areas of information in a manual can include the following:

- System overview.
- Input forms and their preparation.
- Output reports and related error messages.
- Pertinent program descriptions (if desired).
- Code listings.
- Glossary of terms (if desired).
- Clerical functions to be performed using the forms or reports (if desired).

Each area of information in a user manual requires an individual chapter. If further divisions are necessary, they should be numbered for ease of referral.

Data Center Functions

The third vital area of documentation details the steps necessary to perform specific functions in a data center and its related departments. These individual work procedures are broad in coverage. They provide a link between personnel and the computer.

Procedural writing requires a different approach. The tone of the narrative must be geared to the individual.

All procedural steps require the imperative tense except when explaining some point. By using this technique, the reader of the procedure knows the information is directed to him.

Since these procedures are unique, isolate them by operational group. Number them and place the master copies in a binder with a table of contents.

Other types of supplementary documentation support these major areas. Even with their individuality, basic rules for writing, consistenty and factual correctness must be remembered.

Zaneski is a technical writer at United Jersey Bank in Hackensack, N.J.

Alan Taylor is on vacation this week.

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Letters to the Editor

2001 Should Be Fun

Marvin Goldstein's letter [CW, May 3] mentioned only one future date that is going to cause problems.

I hope all those problems will be solved before Feb. 28, 2100. At midnight on that date, the calendar will change to April 1, but the standard method of checking for a leap year is to divide the year by 4.

The year 2100 is not a leap year, but a whole potfull of programs will calculate that it is.

Let's stick around and watch the fun.

Monty Goolsby
Savannah, Ga.

Opening the Doors

"Mistakes in Selecting Gear Avoidable" [CW, April 12] described an approach used by "ivory tower experts" who clearly do not know what it's like in the real world.

It is their oft-overpaid-for recommendations that create much of the trouble and mistakes that plague the average end user. Just because there is expertise around in vendors' and users' organizations, it cannot by virtue of its existence prevent someone from making an incorrect selection of equipment or a bad estimate of cost.

It is an implied duty of each conscientious user to keep pace with developments in technology and equipment. There is no problem because there is no single guru of DP information (Herb Grosch excepted); on the contrary, there is opportunity!

Every user should be grateful for competition. If it didn't exist, he would soon be subjected to some strong-arm tyranny – an environment that soon sparks competition.

The article suggested that an open-door policy for salesmen is impractical. Let this letter call attention to the real world and suggest that this is the way it really happens. Nothing happens in this life until someone is sold something – and many articles in *Computerworld* have been dedicated to the testimonies of those who have found both mechanical and system advantages plus dollar savings by opening their doors.

In computing an equipment evaluation, the article suggested the academic approach of defining objectives rather than the problems at hand (what you want rather than what you have and live with daily). If C.G. Weitzmann had read any Dunn & Bradstreet report, he would know they are much more meaningful for large corporations than for small companies – especially new ones.

Reid Clark
Scottsdale, Ariz.

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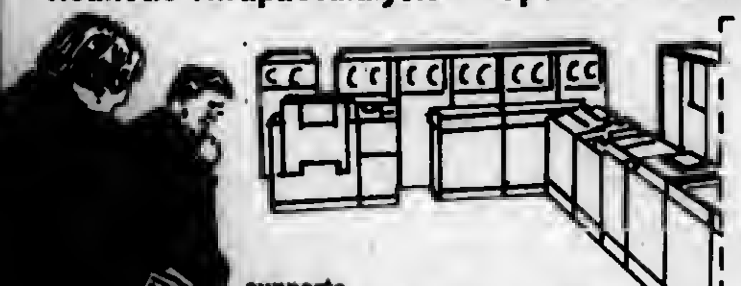

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Remote Translation Puts New Life in Old Programs

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MINNEAPOLIS – Honeywell's announcement in late 1973 terminating maintenance on the old H800/1800s after December of 1975 forced General Mills, Inc. (GMI) to reconsider some of its long-range plans.

A massive number of current production runs would have to be moved to other equipment a lot sooner than had been envisaged. The problem posed was not unique – How can a user protect a programming investment in an obsolete language on an obsolete machine?

What was unique was GMI's answer: to have a small software conversion house perform a translation of over 300,000 source language card images into another language, using GMI's computer here in a time-sharing environment, from a terminal located "down east" in Maine.

The story started in 1960, when GMI selected a Honeywell 800 and the English-like Fully Automatic Compiling Technique (Fact) compiler as its hardware/software combination.

In 1966, the company switched to Burroughs and to Cobol for new business applications. Remaining after this switch were over 700 Fact programs running satisfactorily on a Honeywell H1800.

In 1973 the remaining life of these Fact programs was estimated at five years. To maintain schedules calling for future re-systemization of these applications, the GMI Planning Group needed a quick method of moving production runs of H1800 Fact programs to a Burroughs B6700 environment at a cost commensurate with their projected life.

It Can Be Done

One small software house, Data Services, Inc. (DSI) of Augusta, Maine, proposed an ell-electric transformation and produced a set of detailed design specifications showing such an approach was feasible.

DSI argued that since the Fact programs were performing satisfactorily, a perfect translation of application intent would result if the logic inherent in the Fact source programs was expressed in standard Cobol.

The outstanding difference between the two languages was input data handling, and that could be reconciled by using Cobol Working Storage.

Fact allowed the programmer to obtain individual data groups, using any one of six different input statements. In their place, Cobol statements were generated to move specified data groups from the File Section into Working Storage, in direct imitation of the Fact input routine.

Output was formatted to facilitate input handling. Data file conversion was also to the same format. All procedural data references were to Cobol Working Storage.

DSI also automated the administrative chores associated with planning and scheduling the move to the Burroughs machine.

The manual labor of transformation scheduling and accounting was minimized; the B6700 computer not only performed the program translation and data conversion, but also scheduled and controlled it.

Tabled Translation

The translation process required the use of numerous tables. The Fact source language programs were read as data by the translation program and parsed into fixed-length numeric fields using a Fact reserved word table.

User data and procedure name tables created in the process were filed for later reference.

Using a syntax table, the input stream was reduced to statement number operators. A functionally endomorphic mapping of Fact statement numbers into Cobol statement numbers was done through a transpose table.

The result was then exploded into Cobol language via Cobol statement and reserved word tables, utilizing the data and procedure name tables previously filed away.

In the intial data reduction, table searching was necessary, but all other tables throughout the process were entered directly by making the unique numeric indicator for each element in any table a value that was a pointer for a subsequent table entry, thereby minimizing translation time.

The tabular data was entered, corrected and stored on disk as data files and the translation programs themselves as modular ANS Cobol source files, using standard Burroughs communications and editing software.

A specially written remote job entry program dynamically prefixed work file titles referenced by the generated job control deck files with job number (for the sake of uniqueness) and then purged them when the translation was done. Multiple translations could therefore be scheduled and run at the same time without interfering with each other.

During the translation software development stage, systems dumps were redirected and reformatted from the printer to a temporary file on disk for terminal access purposes. The Fact input was loaded to disk on request, and the Cobol output was initially on disk.

Thus the entire translation system could be developed, initiated and monitored from a remote terminal 1,500 miles away from the source language library.

GMI's primary concern was the runtime for the translated production programs. After a sufficient volume of runs to establish a trend, B6700 runtime averaged about one-third the comparable run-time on the H1800.

DSI can be reached through P.O. Box 0, Augusta, Maine 04330.

Hardware-Software Line Blurs in Firmware Products

● 'Micro Basic 1' Uses Intel 8080

CULVER CITY, Calif. – Micro Basic 1, now marketed by Hamilton/Avnet Electronics, is a full Basic language compiler system operating on an Intel 8080 CPU "chip."

It will soon be released on the Motorola 6800 microcomputer as well, according to the developer, Ryan-McFarland Corp.

Micro Basic 1 was designed to support fast and accurate development and delivery of application programs for micros, a spokesman said.

Everything needed – compiler, text editor, loader, debugger and runtime support – is provided in a single package operating right on the microcomputer itself, he added.

The programmer may use any of several I/O devices to submit his work. Fast integer arithmetic and powerful string-handling features make Micro Basic I "the perfect system" for almost any microcomputer application, Ryan-McFarland claimed.

Compiled programs are supported by two subsystems. The runtime system contains all the arithmetic, string-handling, I/O and control routines required to execute the user's program; the load-and-go system includes the runtime routine and a relocating linking loader.

Both of the subsystems are available now in programmable read-only memory (Prom) from Hamilton/Avnet and will be available in read-only memories (ROM) as well.

By combining the Ryan-McFarland software and the Hamilton/Avnet firmware into a single product, a system can be built that will execute any compiled Basic program, the vendor said.

The total Micro Basic 1 package is "highly adaptable," according to Ryan-McFarland, and will fit into "any machine environment" as a system component.

It is intended primarily for OEM and system house use, the spokesman added.

Ryan-McFarland is at 608 Silver Spur Road, Rolling Hills Estate, Calif. 90274. Hamilton/Avnet, with outlets across the U.S. and in Canada, is headquartered at 10912 W. Washington Blvd., Culver City, Calif. 90230.

● Driver on Nova Works With 'Iris'

IRVINE, Calif. – A firmware-oriented multitasking version of the Interactive Real-Time Information System (Iris-F) from Educational Data Systems (EDS) includes a firmware driver parallel processor to perform "penny-precision" decimal arithmetic on Data General Corp. Nova minicomputers.

An "advanced index random file structure for data base management systems" is also part of the software/firmware system, according to EDS. Iris-F supports multiple languages, and interrupt-handling capabilities allow users to concurrently run real-time tasks in foreground, time-sharing tasks in "middleground" and batch tasks in background.

Tasks can be core-resident for fast response or stored on disk and swapped in and out on demand. "More than 1,000" priority levels are provided, and priorities may be dynamically adjusted to reflect current job stream resource demands.

In Iris, peripherals are treated the same as files. Channel I/O allows either file or peripheral assignment to be made by the operator at runtime, the vendor said.

Iris supports a business-oriented Basic, a conventional Assembler, a Macro Assembler and a Report Writer language in time-sharing mode. "All necessary tools" for writing new processors and integrating them into the Iris environment are also in the system, and users are encouraged to use these tools, EDS said.

Data base management in Iris includes support for text, formatted and contiguous file structures as well as the newly implemented index random files. The new capability permits a common data base to be accessed using any search key for which a directory has been established.

In time-sharing operations, Iris supports "32 or more" users. The system operates on any Nova-type computer with 16K to 32K memory and multiple disk capability, EDS said.

Iris-F is available for $3,600/system, "including 30-day warranty. The Iris subscription service extends the warranty to one year," EDS noted from 17981 Sky Park Circle, Irvine, Calif. 92707.

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'Shorthan' Eases Initial Cobol Coding

TAMPA, Fla. – Described as a "front end" to a source statement library maintenance system and "not a precompiler," Shorthan from C.W. Jackson & Associates, Inc. is said to reduce the Cobol coding effort by supporting the use of abbreviations for commonly-used words or phrases.

Shorthan expands the abbreviations into valid Cobol verbs, syntax or data element names, the vendor said.

Installations may determine their own list of abbreviations, use the "standard" ones provided by Jackson or combine the two sources.

The abbreviations reside on a permanent tape or disk file and are dynamically loaded into an internal core table each time Shorthan is used.

Since the table is under user control, it may be changed as new situations arise. Different application areas, for example, can use different abbreviations – with meanings peculiar to each area – for the same data element, Jackson said.

The use of abbreviations not only reduces programmer time and effort, the vendor said, but also the potential for errors in keypunching and diagnostics in the compilation process itself.

First Letters

The abbreviations used typically are made up of the first letter of each word in the phrase being shortened; LABEL RECORDS ARE STANDARD might therefore be coded as LRAS, Jackson explained.

Shorthan is written in ANS Cobol and can be installed on a "wide range of computers." In an IBM environment, it usually requires a partition or region size of 48K bytes.

The package is available to U.S. and Canadian users for a one-time charge of $500 plus installation costs, Jackson said from 11700 N. 58th St., Tampa, Fla. 33617.

CMG Issues Call For CPE Papers

WASHINGTON, D.C. – The Computer Measurement Group (CMG) has issued a call for papers to be presented at the group's annual meeting in November in Atlanta.

Discussions of performance management and technology, as well as tutorials on basic computer performance evaluation (CPE) concepts, are of interest, according to technical program chairman David Lindsay.

Abstracts (in five copies) should be submitted before June 1 to Lindsay at Fedsim/AY, Washington, D.C. 20330.

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Codasyl Report Explains Choice of DBMS Ingredients

By Don Leavitt

Of the CW Staff

Data Basics

NEW YORK – The latest report of the Codasyl Systems Committee may bring sighs of relief from those installations seeking detailed help in deciding what capabilities, if any, of a data base management system (DBMS) they need.

In its 235 single-spaced typed pages, *Selection and Acquisition of a Data Base Management System* doesn't mention a single system by name. It leaves that to the earlier reports of the Codasyl Data Base Task Group, to numerous other books and to the vendors' own literature.

But even without naming specific products, the report outlines the general characteristics of DBMS now on the market and points out fundamental differences of which users should be aware – the difference between "self-contained" and "host language" systems, for example.

Recognizes Two Users

The user's view predominates, but even that isn't completely accurate because this report recognizes there are, in fact, two types of users. And it separates its discussion into sections aimed at non-DP end users and at the technician who needs to know what is happening below the surface of the DBMS. . .

Codasyl also recognized the report in its entirety could be overwhelming: "The authors anticipate that the reader will read through the entire document, but will find that intensive study of various parts of its contents can be done without complete and total grasp of the report," the preface noted, adding chapters and sections are set up as independent items.

The report's makeup is illustrated by its treatment of "Programs and Processes" in the chapter on "System Selection and Acquisition," which itself appears only after four chapters of preliminaries.

Assuming the installation has a need to integrate its existing programs into the DBMS and most of the programs are written in a particular higher level language, "there will probably be a requirement that the [DBMS] have a compatible host language capability," the report noted.

Conversion Strategy

Conversion of a large number of programs is normally staged in order to reduce the need for an increased conversion staff. The prime application areas – those which "most substantially benefit" from the DBMS – must be converted first, Codasyl said.

If more than straight conversion is needed, "it is sometimes good to acquire self-contained capabilities as a means to provide tools for developing redesigned applications and to simplify the task of debugging both processing and file design," the report added.

Data is of primary concern to Codasyl and the DBMS "data structure must enable the user to access data via previously defined paths and must contain all necessary data."

To enable the conversion team to relate the existing data names to the standard data names in the DBMS schema, the report calls for implementation of a data dictionary facility.

Warning and Solution

Then it adds a warning – "Where substantial redesign is attempted, the redesign of the data structure is a . . . problem. Errors in the definition of the new schema are certain" – before offering a solution: "System capabilities which aid in reorganizing files can substantially reduce the cost of redesign."

If existing programs are not written in a host language accepted by the DBMS, there is still hope. "Adaptive models and systems to provide adaptive programs are still in their infancy," the report acknowledged, "but language-to-language conversion processes are becoming more abundant, as are automated aids to conversion.

"If special uses are being made of data, causing high program volatility, a case can be made for acquiring capabilities to support selection and presentation," it continued, noting the needed facilities might be those which maintain private or interim files for analysis.

Interactive facilities to aid analysis and support user learning would also be useful, according to Codasyl.

Selection and Acquisition of Data Base Management Systems is available for $12/copy from the Association for Computing Machinery Order Department, P.O. Box 12105, Church St. Station, New York, N.Y. 10249.

Range of Topics Set In Courses From BCS

DOVER, N.J. – Computer-oriented training courses have been planned at six sites for this month and next by the Education and Training Division of Boeing Computer Services, Inc. (BCS).

The courses are not open to the general public, but only to personnel sponsored by their companies or organizations, BCS noted.

Classes are being held in Chicago, Detroit (Dearborn), Denver, San Francisco, Seattle and Wichita, Ks. Additional information is available from BCS representatives at the phone numbers noted in the schedule below:

Chicago (312 781-7900): Cobol Optimization, May 24-26; Project Management, June 28-July 1.

Detroit (313 271-8450): Cobol Sort and Report Writer, May 19; Cobol Table Handling, May 20; Data Base Concepts, May 24-27; Advanced Programming Techniques, May 24-27; Basic JCL, June 1-4; Project Management, June 2-4; Systems Analysis, June 7-11; 360/370 Assembler Language Workshop, June 7-11; IMS/VS Data Base Design, June 14-18; Introduction to OS/VS, June 17-18; Overview of Minicomputers, June 21-23; Mark IV Basic, June 21-25; Introduction to Teleprocessing, June 24-25; Mark IV Complete Retrieval, June 28-30; Presentation Techniques, June 28-30.

Denver (303 320-4720): People to People, May 26; Project Management, June 7-9.

San Francisco (415 964-8555): Advanced Programming Techniques, May 24-27.

Seattle (206 773-8683): People to People, May 19; Profit Through Customer Service, May 20-21; Advanced Programming Techniques, June 1-4; IMS/VS Data Base Design, June 7-11; People to People, June 11; Presentation Techniques, June 23-25.

Wichita (316 687-2824): Project Management, June 21-24; Presentation Techniques, June 28-30.

Information about future courses and locations is available from BCS, which can be reached through P.O. Box 708, Dover, N.J. 07801.

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Performance Management—Part 2

Aim at Areas With High Payoff for Users, Managers

By Larry F. Hart
And Dan Coapstick
Special to Computerworld

Armed with the indoctrination and education outlined in the first article of our two-part series [CW, May 10], users should find the development and implementation of a performance management program increasingly simple.

Performance Evaluation

After getting started, there are several steps in the development of a successful program. The first is to define the objectives of upper management.

What do the people who approve the DP dollars expect from the DP center in terms of services, user satisfaction, management information systems, accounting, payroll, development, etc.? What requirements must it serve? What criteria must it meet, i.e., production schedules, response to users, etc.?

Also, what are the constraints for performance and DP in terms of money and people. (A reasonable estimate of budget requirements for a computer performance evaluation (CPE) effort is 5% of total DP budget.)

Define Objectives

Once this is established, the objectives of the DP community must be defined in detail. Many objectives are based on the functions of each segment of the community, but there should be some general commonality of objectives among line groups and between the line groups and the center manager.

If none of the line groups share objectives with the management, a problem more serious than performance is suggested.

At the completion of this phase, an objectives tree chart is conducive to consolidation of the defined objectives for the DP community. Appropriate correlation must be identified to establish a hierarchical structure and interrelationships throughout the DP management chain.

Finally, define the level of importance of objectives and the priorities for the performance management effort. This assures recommendations made by performance management efforts will be supported by management and correspondingly justifies each such effort.

The next process is to define the measures for every objective on the tree chart with priority given to the common objectives of the community and management.

Many measures can support multiple efforts, and by defining the measures and purposes it is possible to avoid collecting proliferations of data with little potential return on expended effort.

Next, identify the accessibility or availability of the measures and all the tools necessary to collect the defined measures. Using the priorities established – budgets, goals and commonality of purpose – the user can make the proper selection of tools to fit his immediate and future needs.

At this point a plan for the staged development of an in-house capability must be prepared. Initially, select the measure with the highest benefit return for the money and effort invested.

Historically it has been demonstrated that 20% of the application programs use 80% of the available resource. Concentrate the efforts on the smallest entity providing the most benefit.

Implement your measurement effort as planned, but realize that after the implementation there are several major points to be remembered when preparing recommendations.

If recommendations are to carry their proper impact to management, there must be cost savings figures attached. Technical recommendations without estimates of potential cost savings lack the necessary emphasis at the management level.

Recommendations must be aimed at solving the problems that are hindering the objectives of management. Correcting deficiencies does not always require acquisitions of hardware or software.

Solutions and recommendations must be aimed at the objectives of upper management to establish credibility and gain the necessary management support for the implementation of recommendations.

Hart and Coapstick are with the performance services section of CACI, Inc.-Federal in Reston, Va.

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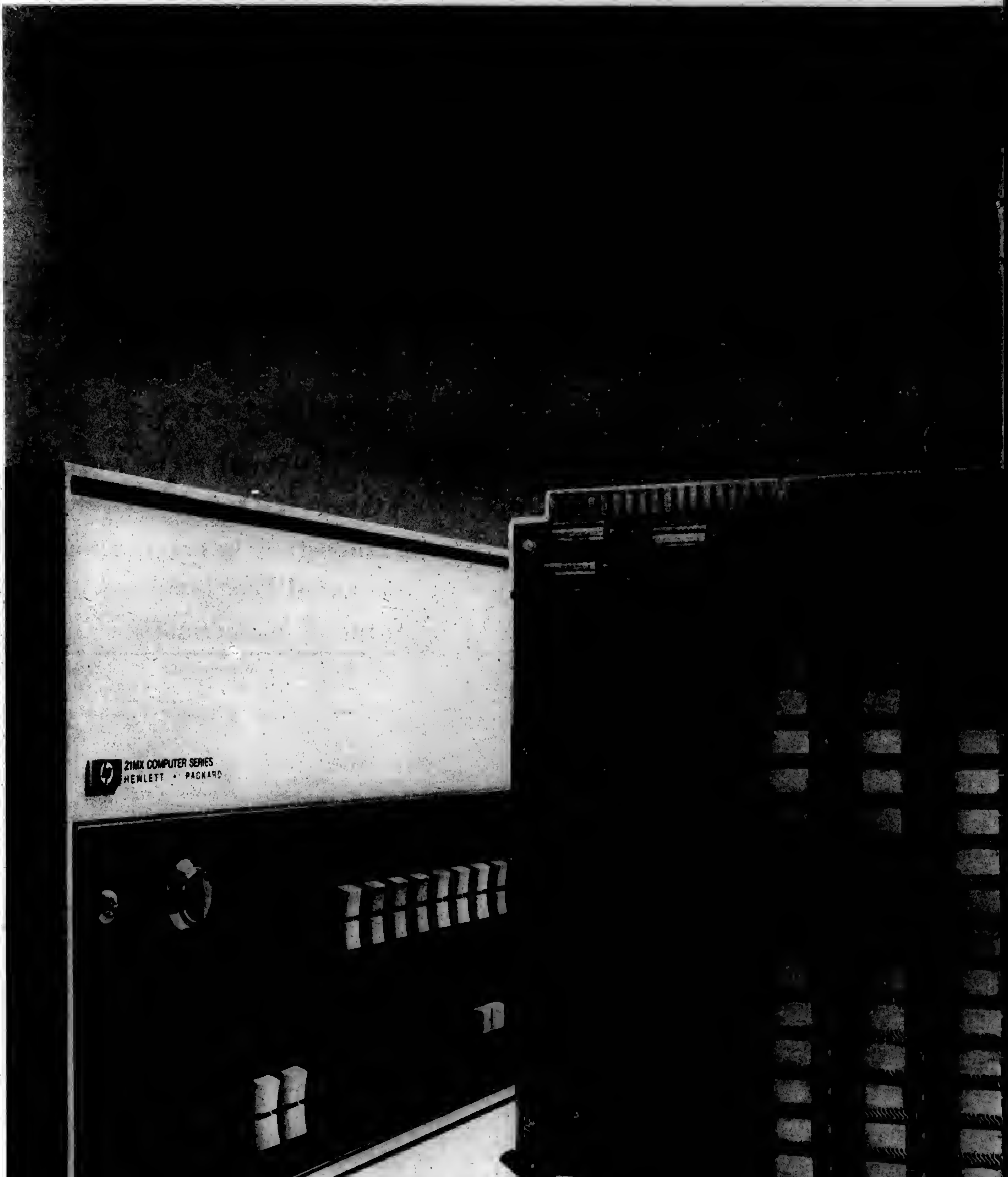
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Current Accounting Information Handled on Mini With 'Midas'

CHICAGO – Manufacturers, wholesalers or retailers with a need for up-to-the-minute information may be able to satisfy that need with a Basic Timesharing, Inc. (BTI) mini and the Management's Interactive Data Accounting System (Midas) software from DLM Enterprises.

Midas provides "instant accounting," according to a DLM spokesman. The modular package, written in Basic, includes subsystems for general ledger, inventory control, order entry and invoicing, accounts receivable, accounts payable and payroll.

Under Midas, every transaction is posted to all related ledgers and subledgers. Since the entire accounting system is updated as each transactions is entered, Midas is always current, the company said.

A continuous audit trail is provided as each transaction is "tagged" for type, date, amount and source. Both internal and external auditors can always find out "exactly what's going on" in Midas, DLM said.

Reports User-Formatted

Reports can be formatted by the user. Flexibility in account structuring allows financial statements to be generated in the form management wants; the interactive capability provides them when management wants them, the spokesman added.

Although several of the modules can be used as self-standing systems, the integration of manufacturing and accounting activities made possible by linking the modules provides management with "full visibility and control" of company operations, he said.

Vendor support includes "as much on-site installation help as seems necessary." Since that and accessibility to client locations vary widely, the cost of the software would range from $12,000 to $20,000, according to a DLM estimate.

The company is at Suite 1632, 919 N. Michigan Ave., Chicago, Ill. 60611.

CDC Net Service Grows

MINNEAPOLIS – DP facilities just opened in Belgium allow European users to tie directly into Control Data Corp.'s Cybernet data services network based in the U.S., according to a company spokesman.

At the same time, a Canadian facility has enhanced support for users from that area, he said.

CDC also expects to provide business time-sharing and scientific remote batch services in Japan, but is unable to set a definite date for that phase.

Concrete Programs Sought

DETROIT – Data on the availability, features and documentation of existing concrete design programs is sought by the American Concrete Institute (ACI) for publication in the *ACI Journal*.

The emphasis will be on relatively small, portable application programs used in design and detailing of concrete structural elements, a spokesman said. ACI Committee 118 is currently calling for abstracts of programs related to beam, slab, column or footing design, he added.

ACI can be reached through P.O. Box 4754, Redford Station, Detroit, Mich. 48219.

Carmen Miranda's Brazil is now a thriving EDP market, and home of *Computerworld's* newest publication— *DataNews*.

When it's carnival time in Rio, computers aren't exactly the first thing that come to mind. But in Latin America, Brazil is where the computers are — 65% of them in fact. There are 3,793 computers installations in Brazil, and the number of installed computer systems grew by an amazing 37% between 1974 and '75.

To supply these installations, Brazilian computer users imported more than $370 million of computers and computer related equipment in 1975. And that figure will be even larger in 1976, as there is a growing demand for data processing and data collection systems, minicomputers and add-on peripherals in the Brazilian market.

Why all the impressive statistics? Because *Computerworld* has a new sister — *DataNews*, the computer newspaper for the Brazilian computer community. Published by Computerworld do Brazil Ltda., *DataNews* has an initial circulation of 15,000 among top management in business and industry and other key buying influences in the Brazilian EDP market. It is now serving this community with the same kind of editorial content and quality that has made *Computerworld* a leader in the United States.

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Service Expansion Planned This Year

DDS Less Costly Than Proposed MPL: AT&T Official

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T's Dataphone Digital Service (DDS) provides users with cost advantages when compared with its recently filed Multi-Schedule Private Line (MPL) rates, according to Wayne Robins, director of data services for AT&T.

At 4,800 bit/sec, DDS "shows a cost advantage up to about 1,900 miles" when compared with proposed MPL charges, Robins said at a session on digital services at the recent International Communications Association (ICA) conference here.

At 9,600 bit/sec, DDS "shows a digital advantage up to [a distance of about] 1,000 miles," he said.

The analog MPL rates used in the comparison represented the best solution between Category A rate centers, he added.

The MPL rates were recently filed with the Federal Communications Commission (FCC) to replace the earlier Hi/Lo private line rates [CW, April 26]. The MPL tariff proposal is now pending before the commission and will take effect on May 20 unless the commission decides otherwise.

During 1976, AT&T plans to expand DDS service by adding off-net analog extensions to users located outside major digital cities. Also planned are local intrastate DDS networks and the expansion of DDS to about 100 major cities, Robins told the conference.

DSDS Combines Technologies

Turning to AT&T's pending proposal to offer its Dataphone Switched Digital Service (DSDS), Robins said this service combines digital data technology with switching technology.

Construction of the necessary facilities for DSDS have been completed and the system is now operating with Bell system administrative traffic, he said.

Robins listed "less than 3 sec call setup" and a disconnect time of "less than 100 msec" among the planned DSDS features.

Addressing information on DSDS will be transmitted in the bit stream as "standard Ascii characters" and the service will be "code-transparent" in data mode operation, he added.

Other DSDS features include pricing sensitive to time and distance, a multiline hunt capability and billing details on calls. The system is ready to begin handling customer traffic as soon as FCC authorization is given for the service, he said.

Initially DSDS will serve users in 18 cities using 56 kbit/sec digital channels. An additional nine cities will be added during 1976, he said.

Rate elements included in the DSDS user's monthly bill will be a Switched Digital Access Line (SDAL), time and distance charges with the time portion based on a 10 sec minimum and additional 1 sec increments and a Switched Digital Service Unit (SDSU).

A user with a New York-Chicago DSDS facility will pay about $670/mo for the station arrangements and SDALs, Robins said; initial service usage periods of 10 sec will cost about 12 cents plus about 1 cent for each additional second.

Using this line for one hour per day for

(Continued on Page 28)

Supermux Among Show Introductions

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Data communications products and services were introduced by many of the more than 90 vendors at the International Communications Association (ICA) conference here recently.

Infotron Systems of Pennsauken, N.J., showed its Timeline 780 Supermux which is said to eliminate errors on high-speed links between multiplexers.

The microprocessor-controlled unit can be used to upgrade previously installed Infotron multiplexers by replacing the central logic scanner. It can intermix speeds, data rates and protocols while allowing both synchronous and asynchronous channels to contend for the same band width, the firm said.

The 780 includes a system status reporting capability which can be accessed by the user by interfacing with an Ascii-compatible terminal. The unit is described as compatible with AT&T Dataphone Digital Service (DDS) and it can accept a mix of dial-up and private-line facilities.

Input speeds to 9,600 bit/sec can be accommodated in point-to-point and multipoint nets, and up to 128 channels can be handled. The 780 is said to use a modified Synchronous Data Link Control (SDLC) transmission protocol between multiplexers in a network.

Upgrade versions of the central logic unit cost $2,500 per end, and initially installed systems cost $4,100 plus $450 per channel. First deliveries are scheduled for July.

Infotron also showed its Timeline 280 multiplexer that allows dial-up applications to use DDS, the firm said. The 280 costs $2,200 plus $300 per channel.

Western Union Information Systems of Mahwah, N.J., introduced its Remote Line Adapter RLA-2100 network processor which operates as a line control unit to the firm's earlier C-2100 front end. The RLA-2100 terminates asynchronous lines operating at up to 1,200 bit/sec on dial-up or private-line facilities.

The line adapter costs $5,000 to $6,000 depending on options, a spokesman said.

The firm also introduced the Series 1000 terminal control unit which can handle terminals used in data preparation, batch and conversational applications. The Series 1000 costs $1,500 to $2,000 with first delivery in the third quarter.

General Electric Co. of Waynesboro, Va., demonstrated its Terminet Toshiba extended front teleprinter which prints 158 columns at 1,200 bit/sec in either single- or split-platen formats.

CW At ICA

Both keyboard send/receive and send/receive versions are available with the latter model operating with a magnetic tape cassette buffer. Four character sets, including Ascii and Japanese Kana, are available.

The teleprinter will be available in the

(Continued on Page 28)

Correction

The price for NCR Corp.'s T-77 parallel-interface, read-only thermal printing terminal [CW, Apr. 19] is $2,303 in quantities of one to four units.

Reamer of IBM Elected to User Group Presidency

By a CW Staff Writer

WASHINGTON, D.C. – Raymond V. Reamer of IBM was elected president of the International Communications Association (ICA) during the annual conference of the user organization here recently.

Also elected were F. Thomas Hogan of Monsanto Co., first vice-president; Edward S. Vennum of the LTV Corp., second vice-president; Wylie R. Deakin of TRW, Inc., treasurer; and Lloyd Isaacs of Chrysler Corp., secretary. James Martin of National Steel Corp. was elected to the board of directors.

Outgoing ICA President Roger L. Underwood of Kaiser Aluminum & Chemical Corp. told conference attendees the organization now includes 370 member companies and over 900 individual members.

Membership in the user organization has been limited since last year, and a waiting list of prospective member companies has been established.

About 13 local and regional telecommunications user groups were represented by their respective presidents at the ICA conference and Underwood said a closer relationship between ICA and the other organizations would be established.

During the conference, ICA members held a closed meeting to evaluate how the user group would respond to AT&T-sponsored legislation now pending in Congress that would limit the Federal Communications Commission's (FCC) jurisdiction over the use of non-carrier equipment and the specialized common carriers.

Reactivated Subcommittee

As a result of this meeting, members voted to reactivate the regulatory liaison subcommittee. The subcommittee chairman will be Robert Bennis of Westinghouse Electric Corp.

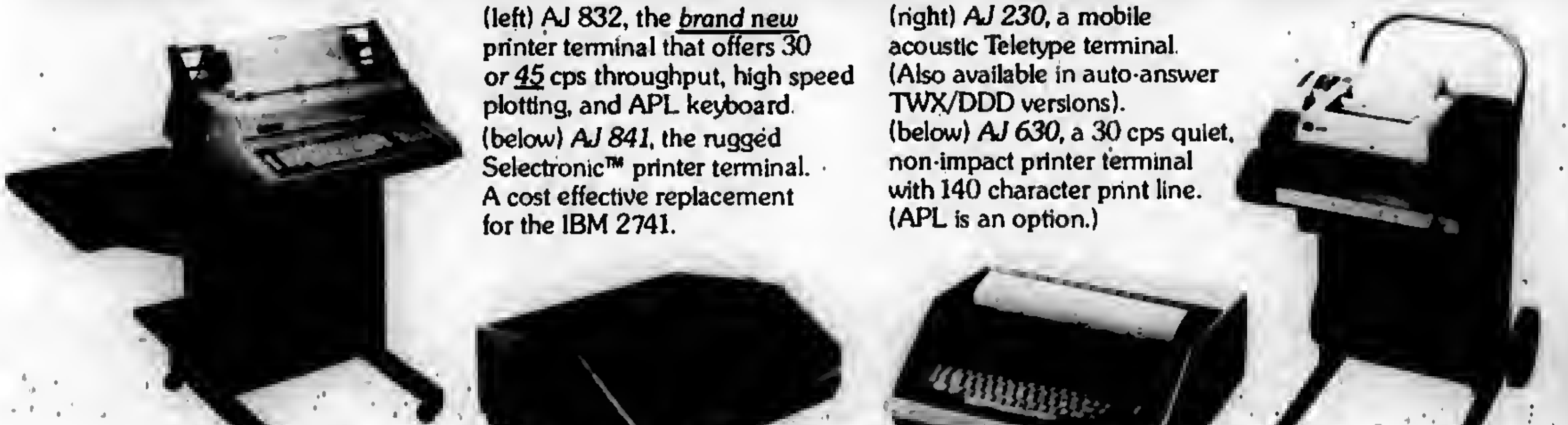
This subcommittee will interface with state and federal agencies and will report to the ICA Technical Development and Liaison Committee, whose chairman is Walter Heide of McGraw-Hill, Inc.

It is believed individual members will be encouraged to take their own positions on the AT&T legislation, and several members indicated they were opposed to the pending congressional legislation.

In his speech, Underwood said events set in motion by the Carterfone Decision in 1968 have provided users with an "independence of choice and a chance to make dramatic differences in the costs of telecommunicating. There were a lot of people willing to take risks to help make this difference happen."

More than 600 ICA members attended the conference exhibition and technical sessions and 90 exhibitors demonstrated their products and services at the show. Next year's ICA conference will be held in Toronto, Canada in May.

ICA events are limited to members only and information about the organization is available from the executive secretary, Box 863, Mundelein, Ill. 60060.



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(right) AJ 230, a mobile acoustic Teletype terminal. (Also available in auto-answer TWX/DDD versions).
(below) AJ 630, a 30 cps quiet, non-impact printer terminal with 140 character print line. (APL is an option.)

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Terminal Transactions

Also Extends Existing SPD 20/20

Incoterm Adds Two Series Featuring 3270 Emulation

By John P. Hebert
Of the CW Staff

NATICK, Mass. – Incoterm Corp. has brought out two series of intelligent IBM 3270-compatible terminals and added an intelligent model to its existing SPD 20/20 series.

Units in the recently introduced Series 30 and Series 40 provide up to 64K bytes of programmable core memory storage and up to 40M bytes of cartridge disk storage. A multistation display capability supports up to 32 CRT stations and 32 printer terminals per cluster, Incoterm said.

Software support for the two series consists of Data Entry Software Levels I and II, a high-level Basic programming language and a file management software system, the company said.

The Series 30 includes a programmed airlines reservation system (Pars) and two models for IBM 3270 emulation. The terminals can be upgraded to the more powerful Series 40; all Series 30 programs can run on the Series 40 terminals, according to the firm.

The terminals in the Series 30 feature 16K-, 32K-, 48K- or 64K bytes of programmable memory; 16 1,920-character or 32 960-character CRT keystations; flexible diskette storage with Incoterm's Diskette Operating System software; and what is said to be extensive peripheral support capability.

Additional storage is accomplished with Incoterm's SPD D-250 diskette system, with 500K bytes per diskette.

Cartridge disk storage is included in the series 40 intelligent terminals and operates under the company's proprietary software system, dubbed the Program Development and File Management System (PD/FMS), Incoterm said.

Program storage of 32K-, 48K- or 64K bytes of core memory is available, as are a large display cluster capability (up to 32 CRTs) and a high-level program language, the vendor said.

A typical Series 30 terminal with dual diskettes costs $14,000, but can move toward the $50,000 mark with 16 CRT keystations; a Series 40 system carries costs from $27,000 to $65,000, depending on options ordered, the spokesman said.

For a basic 16-station cluster with IBM 3270 emulation, a Series 30 terminal system costs $38,000. A comparable IBM price for a 3270 system would cost roughly $88,000, the Incoterm spokesman noted.

In addition to the Series 30 and 40 intelligent terminal systems, Incoterm also introduced the SPD 320 LFC intelligent terminal which features local forms control.

The terminal has 32K bytes of core memory storage and can handle up to eight stations and one printer, according to the company spokesman.

Three printing terminals are offered for the SPD 320 LFC: the P165, a 165 char./sec thermal printer; the 120C thermal printer with 120 char./sec operation; and the LP 125, a 125 char./sec line printer.

The SPD 320 LFC carries a base purchase price of $14,400, he added.

Incoterm is located at 6 Strathmore Road, Natick, Mass. 01760.

Magnetic Tape Device Has $895 Price Tag

WALTHAM, Mass. – Micro Communications Corp. has a magnetic tape unit called the Microvox Communications Peripheral that reportedly sells for approximately one-quarter the price of a paper tape punch and reader and half the price of other magnetic tape peripherals.

The Communications Peripheral can be plugged into any 115V outlet and terminates in a standard 20 ma loop and RS-232C connectors.

The Microvox is fully double buffered and capable of operating under both local and remote control.

The unit stores 20,000 Ascii characters on a 35-ft Microvox continuous-loop magnetic tape wafer that sells for $3.50 in single quantities. Five tape wafers are included in the $895 selling price of the unit. Deliveries are scheduled for July from the firm at 80 Bacon St., Waltham, Mass. 02154.

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'Intelligence' Smooths Emergency Room Procedures

NORFOLK, Va. – Interviewers of patients at a hospital here are working with intelligent computer terminals to help reduce clerical intervention in emergency room procedure so more clinical time can be put toward patients.

The intelligent terminals at the 400-bed DePaul Hospital have accomplished this goal, according to David Hilton, director of data processing for the institution.

The idea of an on-line network doing what two Sycor, Inc. Model 350 intelligent terminal systems now do was discounted because of the constant day-in, day-out nature of the application and the normal maintenance of the CPU associated with interactive systems, Hilton said.

"The terminals have proven the catalyst for rethinking and reorganization of our entire emergency room operations," he remarked.

The emergency room patient is now met by a triage nurse who determines whether immediate medical attention is required or whether the patient can continue through the interview process and then be taken in turn by the doctor.

Terminal Transactions

During the interview, the patient sits down at a desk across from an interviewer who records the pertinent data through the terminal's typewriter-like keyboard for storage on the two flexible disks resident in the terminal.

In the three- or four-minute process, the operator is guided through the complete interview process – the terminal prompting the interviewer to skip a field or demanding that he enter some data into another field.

Dates, times and other variable data is also checked and verified, thereby reducing the error rate.

Because all of the operators are entering data through common programs, doctors receive consistent reports regardless of who is entering the information.

"We use the menu concept where the interviewer selects one of 10 possible functions from the menu by a single keystroke," Hilton said.

That function is loaded by way of an overlay so only the necessary code is resident at any one time.

Response Time No Problem

"Response time has not been a problem with the Sycor equipment, and although the programming is somewhat unorthodox, we are satisfied with the results," he noted.

The program is comprised of 1,076 source statements and requires approximately one hour to compile, making it quite large in terms of intelligent terminal programs.

After the pertinent data is captured on the terminal's floppy disk, it is then printed out on an attached Sycor printer in the form of an emergency room chart and given to the doctor before he begins his examination of the patient.

After the patient has received the examination and his needs have been attended to, the posttreatment process begins.

In the posttreatment interviews, the patient interviewers key in appropriate diagnosis and treatment codes as described by the doctor.

Using the facilities of the intelligent terminal, all items are validated at entry and, when possible, operator choices are displayed on the screen.

At midnight, the diskettes, which can hold three day's worth of emergency room activities, are removed from the terminal and taken upstairs where another Model 350 performs final checks on the data before loading it onto an 800 bit/in. magnetic tape drive.

The tape is then loaded onto the hospital's IBM 370/115-based computer system where it produces outpatient billing information for the business office, the patient and any third-party guarantors, among other reports.

Paradyne Offering Modem Upgrade Plan

LARGO, Fla. – Paradyne Corp. is offering a plan to allow users of its LSI-48 and LSI-72 modems to upgrade from 4,800 and 7,200 bit/sec respectively to 9,600 bit/sec.

The upgrade is available to all users anytime during the first 24 months of installation at a nominal conversion charge.

Credit is allowed for all payments made from initial installation to date of upgrade, the company said.

The modems will be upgraded at Paradyne's manufacturing facility here. The user will be provided with a 9,600 bit/sec LSI-96 at no charge while the upgrade takes place, Paradyne said from 8550 Ulmerton Road, Largo, Fla. 33540.

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Supermux Among Product Debuts

(Continued from Page 23)

first quarter for about $5,000 for OEM users. End-user prices have not yet been set, a spokesman said.

General Datacomm Industries, Inc. of Wilton, Conn., showed its GDC 3000 series network diagnostic control system which can operate as a microprocessor-controlled network diagnostic control system.

When operating with nets using multiplexers, concentrators or remote minicomputers, the GDC 3000 can perform network diagnostics without interfering with the main data channel, a spokesman said.

The system can remotely address up to 32 stations on a multipoint net. A typical system costs about $2,000 for the central control station plus about $700 for each remote point to be monitored.

T-Bar, Inc. of Wilton, Conn., introduced its unattended remote control (URG) system. The system can provide remote control in simple, multistation and multipoint nets to monitor, restore and reconfigure networks. A typical four-line system with a point-to-point capability costs about $3,500.

Southern Pacific Communications Co. (SP) of San Francisco said it planned to file satellite service rates "by May 23" which would provide channels on the Westar satellite (from Western Union) to SP customers.

A typical coast-to-coast circuit will cost $1,000/mo plus $45/mo per circuit termination. Service will be available 90 days after the effective date of the filing, a spokesman said.

Collins Radio of Dallas introduced a digital tandem switch for use by private corporations. The solid-state digital time-division switching system can be used for voice, synchronous and asynchronous data.

A typical system is expected to cost about $1,000/line, with delivery in about six months, Collins said.

DDS Seen Less Costly Than MPL

(Continued from Page 23)

22 business days, a user would incur a usage charge of about $911/mo; the total bill for such an installation would be about $1,581/mo, he said.

Telenet Going International

Speaking at the same session, Roger Goetz, vice-president for marketing at Telenet Communications Corp., said the packet-switched carrier has asked the FCC for authority to establish an interconnection between the U.S. Telenet network and the British packet-switched network operated by the British post office.

Using redundant transatlantic facilities provided by Intelsat, a 300 bit/sec virtual circuit between New York and London will cost between $700- and $800/mo, Goetz said.

A dial-up virtual call service, also at 300 bit/sec, will cost between $10 and $12 per hour over the proposed transatlantic link, he added.

The proposed transatlantic packet-switched service is expected to serve both time-sharing and inquiry/response customers, he said.

Access to the Telenet packet-switched network will also be extended to Canada this year, he said. This capability is being provided through an interconnection agreement with the Trans-Canada telephone system.

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Patrick M. Collins, Data Processing Manager
First Church of Christ Scientist, Boston, Mass.

"Mr. Stimler presents his material in the seminar as he does in his books - with clarity and conciseness, devoid of 'computerese.' Here is a practical methodology for putting data processing and associated services on a scientific, businesslike basis that top management can understand and appreciate."

Robert Barrow, Performance Controller
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"First, I would like to commend Mr. Stimler, who is a rare individual, with a great deal of knowledge of experience, who can impart his knowledge in very clear and precise language. This seminar has reminded me that very complicated situations can be broken down to manageable and understandable parts. I feel that with this beginning, I can proceed to begin to measure and evaluate our computer system."

J.F. McHenry, Manager, Computer Operations
Continental Can Co., New York, N.Y.

Saul Stimler is the Seminar Leader

Saul Stimler is President of Stimler Associates. He is a 16-year veteran in data communications and data processing. He has provided in-house training, specification preparation, design, evaluation, performance improvement, system planning, benchmarking and project management consulting services for leading companies and government agencies in the United States and Canada. Mr. Stimler is the author of the highly acclaimed book, *Data Processing Systems - Their performance, evaluation, measurement and improvement*, and this book will be an important part of the course materials. Advance copies are available - see the coupon below.

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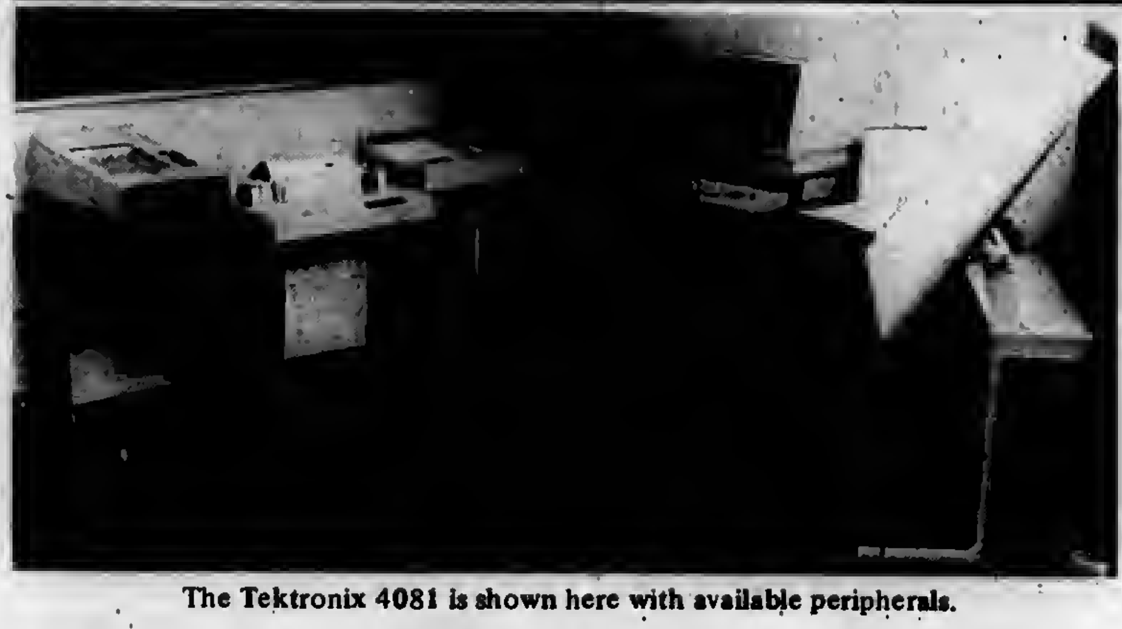

The Tektronix 4081 is shown here with available peripherals.

Tektronix 4081 System Handles Both Refresh, Storage Graphics

BEAVERTON, Ore. – The first of a series of computer-based, interactive graphic terminal systems combining both refresh and storage graphics information – simultaneously – has been introduced by Tektronix, Inc.

The 4081 graphics system has been designed to work effectively as a terminal in a host computer environment and, with the aid of internal programming, as a stand-alone graphics system, according to Tektronix.

Two computers have been incorporated in the 4081 which, the company said, allows the combination of refresh and storage graphics to display large amounts of graphic and textual information without flicker.

One computer is a general-purpose processor; the other is a special display processor, it said. Both are housed in a desk-style unit which also includes a 19-in. CRT display, a tape cartridge drive, Ascii keyboard with 12 function keys, joyswitch and an RS-232C communications interface.

Standard Software

Standard software includes a Tektronix 4014 emulator, making the 4081 compatible with the 19-in. 4014 display terminal, it said.

Also standard on the 4081 is an Intelligent Graphics Terminal (IGT) software package, which allows utilization of the full flexibility of refresh and storage graphics, local data storage and local picture manipulation by the user's host computer application software, according to the company.

Up to 40M bytes of additional local data storage is available with optional flexible and hard disks, it said.

The Graphic Operating System (GOS) is supported by 32K bytes of main memory; this standard memory is expandable to 64K bytes.

GOS is said to provide the user with extensive facilities for picture manipulation, device-independent control of peripherals, task scheduling and host terminal communications.

Optional software for the 4081 includes a programming support package which allows the user to program his special application on the 4081, Tektronix said.

Fortran will be available in three months, according to the company.

A line of input, output and mass storage peripherals is also available with the system.

Terminal Transactions

The peripherals now available include two graphic tablets, an interactive digital plotter 132-column printer, hard-copy unit, tape cartridge drive and flexible and hard disks, it said.

Basic System

The 4081 graphics system carries a base purchase price of $27,000, Tektronix said, and includes a 19-in. CRT display, display controller, 32K-byte computer with parity and a 3M Co. cartridge tape drive with 250K-byte capacity.

Lease prices for the basic system are $1,215/mo and $1,755/mo, for 36- and 12-month leases, respectively, it said.

The prices also reflect an Ascii keyboard with 12 function keys, four status lights and an RS-232C interface with program control of transmission rate from 110- to 4,800 bit/sec and parity; the GOS 4014 emulator; IGT software; and utilities, diagnostics, demonstration software, manuals and installation, the company said.

Available options include 64K bytes of total memory and 32K bytes of additional random-access memory (RAM) with parity ($3,950); and power-fail protection ($600) to preserve memory contents for up to two hours, it said.

The company's Information Display Group can be reached through P.O. Box 500, Beaverton, Ore. 97077.

Cursor-Control CRT Available

MINNEAPOLIS – Research, Inc. has introduced a cursor-control, cursor-addressable CRT terminal.

The Model 3811 Teleray has switchable wide/narrow character display and RS-232 or current-loop interfaces. It displays both upper- and lower-case Ascii characters, the company said.

The cursor is controllable by code sequences from the keyboard or from a mainframe, it said.

X-Y Addressing

X-Y addressing is also accomplished by code sequences – a series of four characters moves the cursor anywhere on the 80- by 24-character, 12-in. screen, Research explained.

All interface codes and choice of 15 transmission speeds up to 9,600 bit/sec are set by dip switches. The unit operates in scroll or page modes, the company noted.

Model 3811 options include columnar tab, video output, peripheral interface, numeric keypad, 15-in. screen and upper-case-only character set.

The 3811 also offers Erase to End of Line and Screen Erase functions and displays a blinking block cursor, according to the company.

The unit weighs 50 lbs, consumes 80 watts of power, comes with a full-screen antireflective faceplate and is priced at $1,550 or $67/mo on a one-year lease with delivery in four weeks, Research said.

The company can be reached through P.O. Box 24064, Minneapolis, Minn. 55424.

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WUIS Enhances C-2100, Adds RLAs

MAHWAH, N.J. – Western Union Information Systems (WUIS) has enhanced its C-2100 front-end communications system and introduced a series of programmable remote line adapters (RLA).

Enhancements to the C-2100 system include a Programmable Line Module (PLM) and a Programmable Line Adapter (PLA).

The enhancements reportedly provide users of Univac 1100, 418 and 494 series systems with programmable network control functions, programmable remote multiplexing, expanded communications line termination capability and flexibility in configuring networks.

The C-2100 is used in large-scale remote-access systems to interface computers to up to 256 communications lines and provide support for up to 1,024 terminals, according to the company.

PLM reportedly controls line discipline and protocols, including those in binary synchronous and data link control environments. A C-2100 system can contain up to six modules, WUIS said.

The PLA terminates a time-division multiplexed line connected to an RLA, it said. The PLA provides the PLM with independent network control functions; each PLM is capable of containing up to seven PLAs.

The RLA-2100 is an intelligent time-division multiplexer (TDM) which provides programmable multiplexing to support up to 20 communications lines, the company said. It is available as a desk-mount unit or a rack-mountable unit.

Automatic polling, down-line software loading, network diagnostics and fault isolation and automatic transmission rate detection and code conversion are said to be provided through the RLA-2100.

In addition, it reduces multiplexer, modem and communications line costs because it does not require a host-site TDM when used with WUIS' PLA, the company noted.

Consistent with distributed network requirements, a network based on the C-2100 system and the RLA-2100 is supported under the firm's planned network control system, it said.

Prices for the enhanced equipment are $2,500 for the PLM; $2,000 for the PLA; and $6,800 for the RLA-2100. Deliveries will begin in the third quarter, the company said from 82 McKee Drive, Mahwah, N.J. 07430.

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Modem Adapter Links Modems, Terminals With Interdata CPUs

ORANGE, Calif. – MDB Systems, Inc. has introduced a Programmable Asynchronous Single Line Adapter (Pasla) which it said provides an interface between the Interdata, Inc. multiplexer I/O bus and any asynchronous modem or local terminal with an RS-232C interface.

Pasla features include switch selection of 16 different transmission rates from 50 bit/sec to 19.2 kbit/sec, switch set device address; and separate 25-pin connectors for modems and local terminals, the company said.

The adapter also features a crystal-controlled oscillator for transmission and optional 20 ma current loop interface.

The adapter is compatible with existing Interdata operating and diagnostic software, MDB added.

All data transfers between the Pasla and modem and control lines generated and monitored to or from the data set are reportedly under program control by providing proper status and interrupt information to the processor.

In addition, line attributes, such as one of two preselected transmission rates, four character lengths, any type of parity and one or two stop bits, are also under program control, MDB said.

The device is contained on a single 7- by 15-inch half-board which is mounted in the Interdata chassis with the Interdata 16-398 half-board kit, the company said.

The Pasla interface is priced at $375, according to the firm at 1995 N. Batavia St., Orange, Calif. 92665.

Link/Chek Offers More Test Capability

NEW YORK – An extension of data link testing capabilities introduced by Com/Tech Systems, Inc. for its Link/Chek 202 system is said to allow testing in multidrop circuits as well as point-to-point links.

The Link/Chek system consists of a 202PM master unit and as many 202PS slave units as there are terminals on the communications line – up to a maximum of 128, the company said.

The 202PM addresses the selected 202PS, together checking the performance of the line-modem combination by employing a 1K-bit pseudo-random digital pattern and EIA signal status indicators, it said.

Link/Chek reportedly can be left on-line since it automatically reverts to the traffic mode after a test and enters the test mode only when instructed.

Slave units can be unattended, which is said to facilitate periodic checks originating at the master end. The master unit also may be unattended through an optional computer control of addressing, the company noted.

Link/Chek is priced at $975 or $1,195 with the computer control option. Slave units cost $595, Com/Tech Systems said from 44 Beaver St., New York, N.Y. 10004.

VNR Announces Dictionary

NEW YORK – The *Data Communications Dictionary* is available from Van Nostrand Reinhold (VNR) for those who are curious about or bewildered by data communications terminology.

The 530-page dictionary, authored by Charles J. Sippl, defines 14,500 terms, concepts, acronyms and abbreviations used in DP and communications, according to the publisher.

It is cross-indexed; major areas covered are communications, carrier systems, special data networks and data system equipment and components.

The book costs $19.95, VNR said from 450 W. 33rd St., New York, N.Y. 10001.

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It reads.

You simply whisk the optical probe across a UPC bar-coded product, shelf label, or shipping label. ULTRAPHASE reads bar codes in virtually every color and can read the code backwards or forwards. If you want shelf labels, they can be bar-coded to your existing product numbers, eliminating the need to recode your inventory. And the labels can contain item, price, date

Bergen Brunswig data entry terminal obsolete.

or other descriptive information in addition to the bar code.

Warehouse label Retail label

It interprets as it reads.

It automatically recognizes both types of UPC (A or E) then reads and calculates the check digit for verification. ULTRAPHASE interprets the bar codes and translates them into digits. The item numbers appear — bright and large — on the LED display as fast as the probe reads the code. If an error is detected, an "E" flashes in the status position and an alarm sounds. When everything is correct, an "A" for "Accepted" appears. The scanning is done without turning on a switch. ULTRAPHASE has no power on/off switches for any procedure. It turns itself on when needed, off when finished.

It remembers.

After the bar code is read, you enter the quantity and ULTRAPHASE remembers both. All entries appear on the display for visual verification and are stored in the removable Memory Pack. At any time, stored information can be recalled and displayed since ULTRAPHASE remembers exactly where each entry is. You can review the entire contents of the memory, or may search for a specific item or group of items. ULTRAPHASE keeps track of the unused memory and informs you on request. Current memory capacities 4000 (4K) and 8000 (8K) characters are available and interchangeable.

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Because ULTRAPHASE stores its data in removable Memory Packs, it has unlimited capacity. You have all the advantages of solid state technology with the flexibilities offered by cassette. Essentially, the ULTRAPHASE Memory Pack is a "solid state cartridge." Each Memory Pack contains an eight-hour charge and when inserted into the service module, activates the recharge cycle. The Memory Pack always remembers the next available location for data storage, even if the Pack has been removed and subsequently reinserted. Because ULTRAPHASE has removable 8-hour Memory Packs, the terminal can be used 24-hours a day. In addition to being portable, it can be used as a work station, utilizing a common 110-volt AC electric outlet.

It speaks.

When you are ready to forward information to a processing center, you simply slide out the lightweight Pack and insert it into the service module. Dial the center, press the transmit button and your information is sent at 120 characters per second. Transmission status is monitored and indicated on the service module.

It protects.

It has the ability to stop errors before they happen. It monitors the state of its rechargeable power source continuously. When it nears an unacceptable operating range, ULTRAPHASE turns on an audible alarm and refuses to take further input. All this automatically. It also lets the operator know when the Memory Pack is nearing capacity. Just prior to the end of memory, it sounds an alarm and flashes "F" for "Full" on the LED display. Finally ULTRAPHASE offers protection against accidental erasure. Since there is no on/off switch, memory can be erased only by a positive action.

ULTRAPHASE is now available in limited quantities. For information please write or call Ronald W. Zolkiewicz, Vice President of Marketing, (213) 549-4040.

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Among the best-known of Bergen Brunswig DataService's developments is PHASE, an electronic order entry, price sticker and inventory management system. Another important service is MICROPHASE,™ a microphotographic information retrieval system, which provides instant access via a Microform System to a library of information. DataService Co. also offers TIPTOP and PAREX computer billing systems that process accounts receivable and create business management reports for some 3,000 users.

Bergen Brunswig Corporation

Bits & Pieces

Inforex Ups Disk Capacity Of File Management System

BURLINGTON, Mass. – Inforex, Inc. has doubled the disk storage capacity of its System 5000 file management system permitting it to handle eight 25M-byte drives.

The previous capacity was four such drives, the firm noted.

Even though the capacity has been doubled, the system still uses a single microprocessor-based disk controller, Inforex said, relieving the central control unit in the system from disk searches.

Each of the drives with the system can be leased for $630/mo on a one-year contract and for $370/mo on a five-year plan.

Inforex expects to double the capacity of the unit again within the next year, it added from 21 North Ave., Burlington, Mass. 01803.

Graham Enhances Tape Evaluator

GRAHAM, Texas – Graham Magnetics Inc. has introduced the Inspector III, an enhanced version of its computer tape evaluator/cleaner.

The unit includes a feature which is said to protect the read-write head by automatically retracting the tape from the head during the high-speed cleaning and rewinding modes.

A 2,400-ft tape can be cleaned, tested and rewound in 5.3 min with the unit and Inspector III provides a printed record of the tape condition – its length and the number of errors and their locations.

The unit costs $9,200, according to the firm here in Graham, Texas 76046.

Macro Products Introduces Printers

LONG BEACH, Calif. – Macro Products Corp.'s four plug-compatible printers are up to 51% faster than their counterparts and cost from $28,000 to $36,000 less, according to the firm.

The four printers have a speed range of 600 line/min to 1,800 line/min. They can be interfaced with IBM, Honeywell and Univac computers.

The M-260 for small computer systems prints at 600 line/min and costs $25,940.

The M-290, which prints 900 line/min, costs $29,715 and was designed for medium and large systems.

The M-470 prints 1,800 line/min and costs $38,200.

The chain-type M-550 prints 1,500 line/min – 36% faster than IBM's 1403 – and costs $42,500.

Standard maintenance contracts of $200/mo to $300/mo are available, the firm said from 3110 E. Willow St., Long Beach, Calif. 90806.

Virtual Storage Coming

Criterion Extends NCR Peripherals' Life

By Ronald A. Frank
Of the CW Staff

DAYTON, Ohio – The NCR Criterion series announced recently [CW, May 3] opens up several opportunities for the company.

First, it provides an upgrade path for the present Century customer base while allowing those users to retain many of their installed peripherals.

This type of marketing strategy is similar to IBM's in that it encourages the installation of larger mainframes.

Secondly, it brings NCR into the world of virtual storage effective next year, when the necessary software is scheduled to be delivered.

Third, and perhaps most significant, the first two announced models of the Criterion line indicate larger models are yet to come.

This may depend on the success of the 8570 virtual system, which was described as comparable to the IBM 370/135 and 145.

Buried in the NCR announcement was the fact that "additional hardware" in the form of a dynamic Address Translation (DAT) box plus additional firmware will be required at $400/mo.

Also, NCR separately priced software will include portions of the operating system.

Thus far the Criterion systems are designed for transactional applications. These take advantage of the smaller processor subsystems such as those controlled by the 725, 8200, and earlier 399 and 499.

What is missing, if large customers are to become interested, is a Criterion direct interprocessor interface capability.

Analysis

All that NCR spokesmen will say for now is that there is a "common trunk" capability between the Century and the Criterion series.

Centurion multiprocessor capabilities and direct Century-to-Criterion interfaces are currently not possible. But if the virtual system is successful and the integrated disk controller needed for the virtual configurations is a big seller, then NCR could turn its attention to the large user.

Corrective Programs Can Move Operations People Off Treadmill

By Jack L. Stone
And Alexander P. Grant
Special to Computerworld

This article was written in response to those who need information on the plight of operations personnel in production-oriented DP centers.

We should note, however, that an article this brief can only highlight the key points about this complex and difficult subject and only describe general approaches to solutions.

The implementation of corrective programs to train, develop and motivate operations personnel, including production control personnel but excluding systems programmers, is expensive – but necessary – in terms of management time, money and services.

There is no simple formula for action. Each installation has its unique characteristics and must be carefully studied in regard to its management, organization, communications, job structures and related factors prior to constructing plans for personnel development.

As is always the case with personnel programs, hastily conceived projects usually produce results so negative as to be counterproductive.

This is one in a series of articles by these authors. In this article, Stone and Grant focus on the role of the operators and how management can support and encourage them. In the next, they will discuss the humanization of the training process.

Our observations of the operations personnel situation in the larger centers supporting the multiprogramming environment can be generalized and summarized as follows:

- Operations jobs have been made highly specific and vigorously routine to ease the management burden. However, the side effects have been to minimize, if not eliminate, demands on the capabilities and technical skills of the individuals involved.

The result is predictable: operations jobs are deadly dull – except when the system crashes, and then the operators have only limited responsibilities.

- Management, having successfully dehumanized the operations functions to make quasi-automatons of its people, has also concluded its automatons do not require training much beyond that required to respond to routine OS messages. This thinking pervades some of the largest and most technologically advanced computer centers.

As a result, training levels in the machine area are absymally low. Operations people are severely limited to a small set of elementary skills, minimally sufficient to get the work out.

Informed understanding of hardware/software concepts is virtually non-

(Continued on Page 39)

CDC Has Add-On 168 Memory

MINNEAPOLIS – Control Data Corp. has extended its family of add-on memories for IBM 370 systems with the introduction of its first unit for the 370/168 as well as another memory for the 370/158.

The units contain 4K-byte semiconductor memory modules which permit 370/168 and 370/158 users to expand their memory up to 8M bytes in a single cabinet, CDC said.

This allows 370/158 users to increase their memories to twice the size available from IBM, the firm noted.

The CDC 33168 main memory units for the 370/168 are available in 1M- to 7M-byte increments at prices 38% to 53% below IBM purchase, CDC said.

The memories are plug- and performance-interchangeable with original equipment and include monolithic technology, an off-line diagnostic capability and a maintenance display panel not available from IBM, the company added.

Expansion or replacement of 370/158 memory can be done in .5M- to 7.5M-byte CDC 33158 increments that are fully interchangeable and priced 28% to 58% below IBM, CDC said.

Features include dynamic memory reconfiguration in case of logic failure; compatability with virtual storage, multiprocessing and Model III systems; and the other features of the 33168, the firm said.

Purchase prices for the CDC 33168 range from $163,000 for 1M byte of storage to $895,000 for 7M bytes. Montly lease for these units on a three-year contract is $4,405 to $24,175.

The CDC 33158 is priced from $94,000 to $845,000 for purchased units and $2,350 to $22,820 per month on a three-year lease.

Separately priced maintenance also is available for both memory series, according to the company at Box 0, Minneapolis, Minn. 55440.

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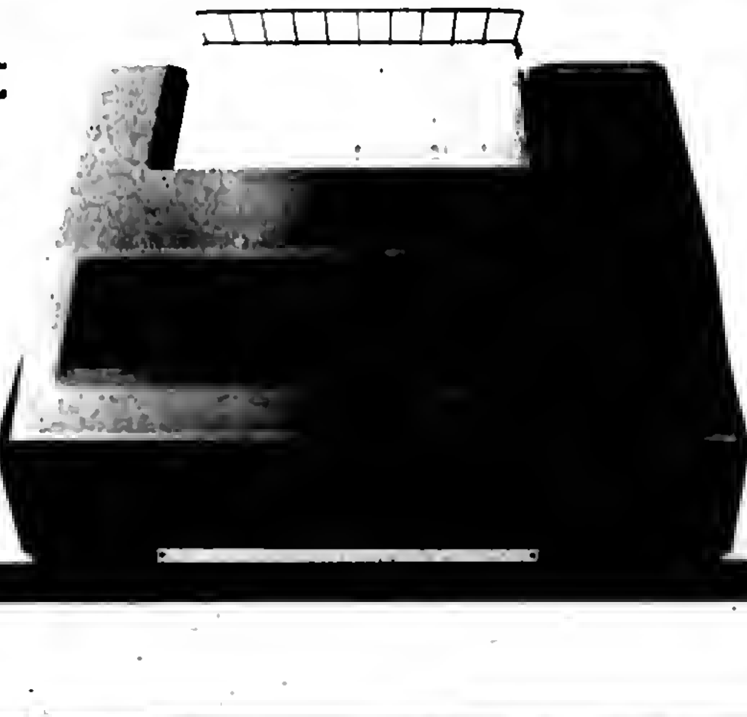

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Can anyone beat the Altair System?

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When it comes to microcomputers, Altair™ from MITS is the leader in the field.

The Altair 8800 is now backed by a complete selection of plug-in compatible boards. Included are a variety of the most advanced memory and interface boards, PROM board, vector interrupt, real time clock, and prototype board.

Altair 8800 peripherals include a revolutionary, low-cost floppy disk system, Teletype.™ line printer, and soon-to-be-announced CRT terminal.

Software for the Altair 8800 includes an assembler, text editor, monitor, debug, BASIC, Extended BASIC, and a Disk Operating System. And this software is **not just icing on the cake**—it has received industry wide acclaim for its efficiency and revolutionary features.

But MITS hasn't stopped with the Altair 8800. There is also the Altair 680—complete with memory and selectable interface—built around the new 6800 microprocessor chip. And soon-to-be-announced are the Altair 8800a and the Altair 8800b.

MITS doesn't stop with just supplying hardware and software, either. Every Altair owner is automatically a member of the Altair Users Group through which he has access to the substantial Altair software library. Every Altair owner is informed of up-to-date developments via a free subscription to **Computer Notes.** Every Altair owner is assured that he is dealing with a company that stands firmly behind its products.

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Positive Acts Take Operations People Off Treadmill

(Continued from Page 37)

existent. We have yet to find an "experienced" operator entering one of our classes who can adequately flow-chart the job flow through the system.

- Console operators have no significant responsibility to assess and act upon hardware/software problems. They are mere onlookers to the familiar theater of the absurd: When the curtain rises on the system crash, the systems programmer rushes on stage to save the dying production process.

He sweeps aside the mere mortals – i.e., operations staff – and succors the process with his magic correctional codes.

Then, after muttering his incantations about the inadequacy of these mere mortals (operations staff again), he departs with a flourish for his microfiche mecca. Needless to say, this show really turns off the people.

- Operations personnel have deep feelings about being the subjects of discriminatory practices of management, vis-a-vis their colleagues on the systems and programming staffs.

Operations people perceive the programmer/analysts are rarely held accountable for their errors; too quick to assign blame to operations people for systems failures; given substantially higher grade and salary structures for similar levels of responsibilities; provided fringe benefits not available to operators (paid time for training and a personal library of technical manuals, for example); and travel to professional and business meetings.

- The operations department, including the manager, rarely has a role to play in the creative aspects of the operation, particularly those relating to the planning and evaluation of hardware, software and application systems.

This absence of participation eliminates a major source of intellectual challenge and professional growth for operations personnel and can result in severe disruption to the production process when new application systems are implemented without adequate notice to operations.

Peopleware

Much can be done by management to improve the production-oriented motivation of operation personnel and to strengthen their commitment to the job and the organization.

Although such actions will require substantial investments in management attention and resources, it will be even more difficult to obtain the necessary changes in management attitudes and understanding of the human needs and aspirations of operations people.

The alternatives to improving the status quo are the dark and gloomy prospects of increasing personnel turnover, decreased center productivity, rising unionism, disgruntled (and, perhaps, mischievous) employees and, at the bottom line, higher costs of operations.

'Turning On' the Staff

There are many opportunities available for "turning on" operations people. Each installation must, however, decide for itself which combination of actions provides the best prescription for its malaise.

There are three major ways this can be done. First, operations people can be given more tools and techniques to perform better in their current jobs.

These individuals feel they have done a great job for years – after all, the work has "gotten out the door" – but have been denied the same support given to programmers and analysts whom they view as coworkers.

Such support may include current information (decent run books on major production jobs, for instance); respected shift supervisors who can provide effective leadership and man/manager communications; regularly scheduled meetings to resolve operating problems; and freedom from harassment by users and systems programmers.

- Secondly, the current operations jobs can be restructured to increase the intellectual challenge to the people. Operations people are demanding relief from the routine and boredom.

Restructuring may involve delegating to selected lead personnel higher level staff assignments; giving basic systems programming maintenance tasks to operations personnel; upgrading the shift leader position to handle increased responsibilities for system problem determination; assigning the tasks of supporting job accounting and charge-back to operations personnel; expanding production control functions to provide job control language support to users; and organizing an operations documentation development section.

- Finally, positive actions can be taken to build programs of personal growth. Operations people are very disenchanted about their future. They see themselves on a treadmill to an opportunity mirage.

They are particulary frustrated and discouraged by the "fancy" salaries commanded by the analysts and programmers who, they feel, have not done the job in developing high-quality systems.

Such programs may include a documented career path with an advancement ladder which allows top performers both to rise in operations and to be promoted up and out to programming; formal performance appraisals by supervisors (who are both trained and skilled in the process) which provide the individual with "straight talk" on where he stands, what his past performance has been and what he has to do to grow and improve in the future; and finally and most importantly, a few sincere and personal words from the top executive, expressing thanks for a job well done.

Stone is the managing director and Grant a senior associate of Computer Education International, Inc., of Washington, D.C.

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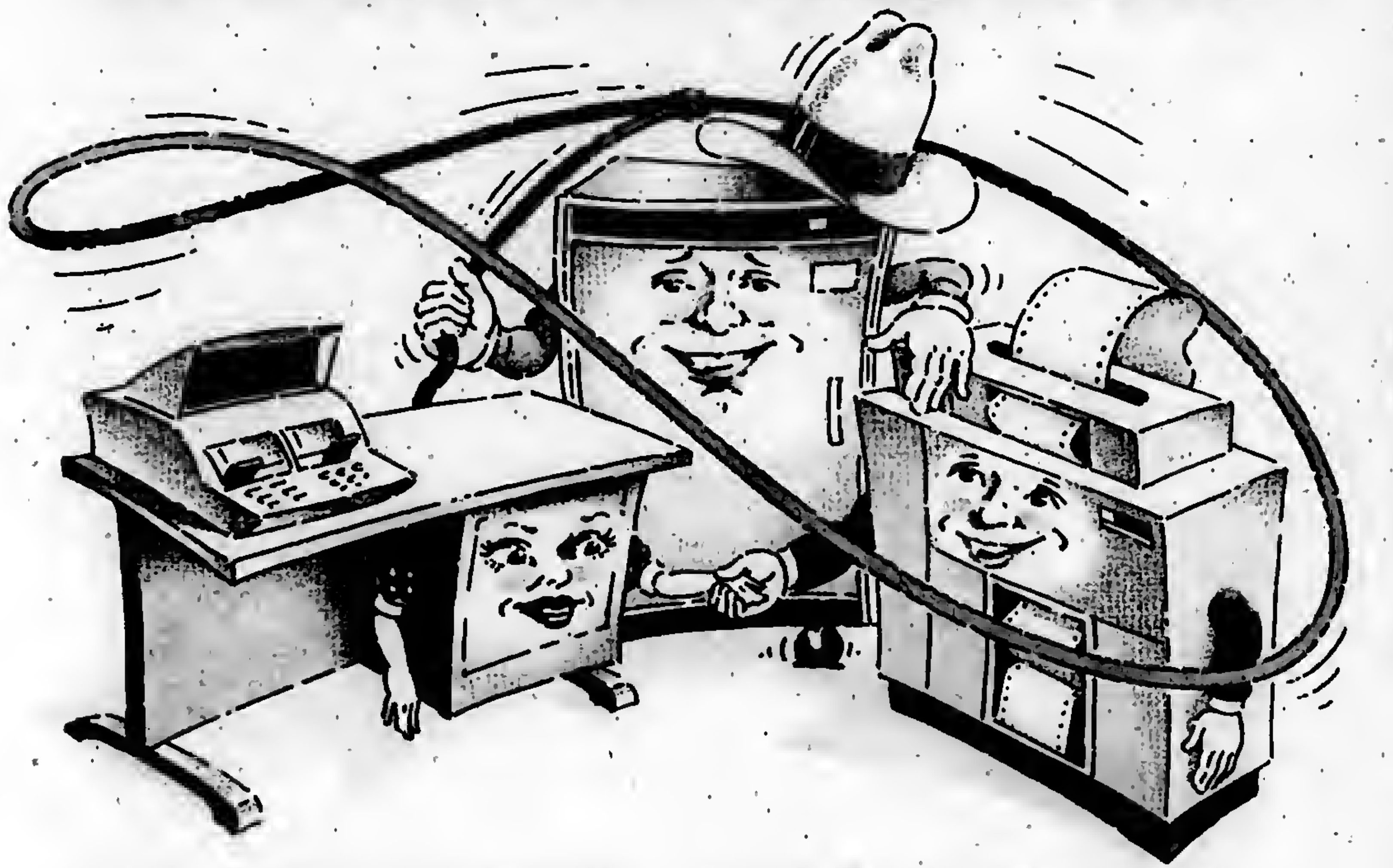

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Cost for the entire seminar, including continental breakfasts, luncheons, dinner, and all course materials is $325 per registrant, and $300 for each additional registrant from the same company. An additional $50 bonus discount will apply to each registration received by June 7, 1976.

Chicago	Drake Hotel	June 17-18

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

New York	Plaza Hotel	June 14-15
San Diego	Plaza International	Sept. 27-28
Denver	Denver Hilton	Oct. 18-19
Miami	Holiday Inn Airport Lakes	Nov. 15-16.

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

New York	Summit Hotel	Sept. 13-15
Miami	Holiday Inn Airport Lakes	Nov. 29-Dec. 1

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Chicago	Hyatt Regency O'Hare	June 16-18
New York	Summit Hotel	June 23-25

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Atlanta	Hyatt Regency Atlanta	May 3-4
St. Louis	Marriott at Lambert	May 24-25

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

Chicago	Hyatt Regency O'Hare	May 17-18
Wash., D.C.	Stouffer's National Center Inn	May 24-25

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For Large-Capacity Facilities

Convenience, Reliability Hallmarks of Data Modules

By Clark Davison

Special to Computerworld

Since they were first introduced to the data processing world in late 1973, data modules have become an important data storage medium.

This new approach has brought the modular design concept to random-access data storage. In a data module, all disks and heads and the spindle are integrated within a completely closed and sealed housing. This means that the potential for contamination and accidental damage to stored data is significantly reduced.

Data modules have proved to be extremely well suited to high performance, large-capacity data storage facilities for applications requiring either random or sequential processing. Examples include inventory and manufacturing control, graphic processing, time-sharing, systems residence and general-purpose storage.

Data modules are designed to operate with the IBM 3340 disk storage facility. Together with the drive, the data modules provide direct access storage for these IBM systems:

- System 370 (models 115, 125, 135, 145, 155-2, 158, 165-2 and 168).
- System 3 (models 12, 15B and 15C).
- System 7.

Provide Versatility

Data modules provide the user an unaccustomed degree of versatility. For example, with certain models of the 370 one might have as many as 64 drives and data modules on-line simultaneously, thus providing a potential 4,480M bytes of storage. Even the smallest system available today will produce a 70M-byte potential.

Additional flexibility of operation is achieved by the various methods of physically attaching the data module drive to the disk storage facility. The data module may be attached to the computer system via direct disk, integrated file, integrated storage control or through a control unit.

For the small- to medium-size user who needs fast random access to stored information, the present generation of data modules can offer immediate economies in terms of initial cost and lead the way to some most attractive ongoing benefits.

Working in concert, a typical data module and the disk storage facility have the following features:

- Start time of less than 20 sec.
- Average access time of 25 msec.
- Average rotational delay time of 10.12 msec.
- Nominal data transfer rate of 885 byte/sec.
- A choice of two basic models: 32M bytes or 64M bytes capacity.
- A third model with fixed-head access to 502K bytes of its total 64M bytes capacity.

Putting the data module to work is truly a "hands-off" act of simplicity. As the module is set directly onto the drive, the drive mechanically opens a door in the module and slides the module forward so that it mates physically and electrically with the drive.

Basically, the data module is a compact, self-contained assembly of mounting and rotation hardware; servo and data disks and built-in heads for reading servo surfaces and reading and writing on data disk surfaces.

Tolerances among all the module's components are measured in microinches and represent a sophisticated challenge in precision location. As the servo and data disks are rotating at approximately 3,000 rev/min (and in an environment up to 240° F) the heads, which move in a radial direction with respect to the spindle, must be able to move precisely to any one of several million transition points.

Utilizing the air lift created by high-speed rotation, heads in the data module fly above the surface of the disks while disks are turning. When the module is not in operation, the heads land and remain in an area where no data is stored.

One of the most critically important elements, if not the key, to the successful operation of the data module is its prerecorded servo surface. This, in effect, is the control mechanism which directs the flying heads to the precise extraction point for each of the millions of bits of data.

One of the major advantages provided by data modules is elimination of contamination and maintenance. The data module is a completely closed and sealed system. The only time the module's door is open is for about a second when the unit is mated to the drive.

There is very little likelihood that contaminants will gain entry and cause a head crash or any other type of damage. There is no need to clean the disks or heads. There are no parts to replace routinely; there is no need for preventive maintenance. It's stricfly a "hands-off" situation.

Another feature of data modules is enhanced interchangeability. The heads in the data module are dedicated to a single data surface. They are required to read only the information they themselves have previously written and thus are not subjected to the peculiarities or vagaries of other data heads.

Variable storage capacity is a third benefit and is one which will vary from one brand of data module to another. Citing the 3M Co. 948 data module as an example, the same drive will accommodate either the 35M-byte module or the 70M-byte and 70M-byte with fixed-head feature) and can be used on IBM drives modified for the fixed-head feature. The user may change his storage capacities from 35M bytes to 70M bytes simply by switching modules.

Also, data modules are equipped with a switch which protects against accidental data destruction.

Defect skipping is a feature which improves reliability and provides better performance by allowing marginal areas designated by the module manufacturer to be skipped without wasting time seeking alternate tracks.

Davison is a technical service engineer with the Data Recording Products Division of 3M Co.

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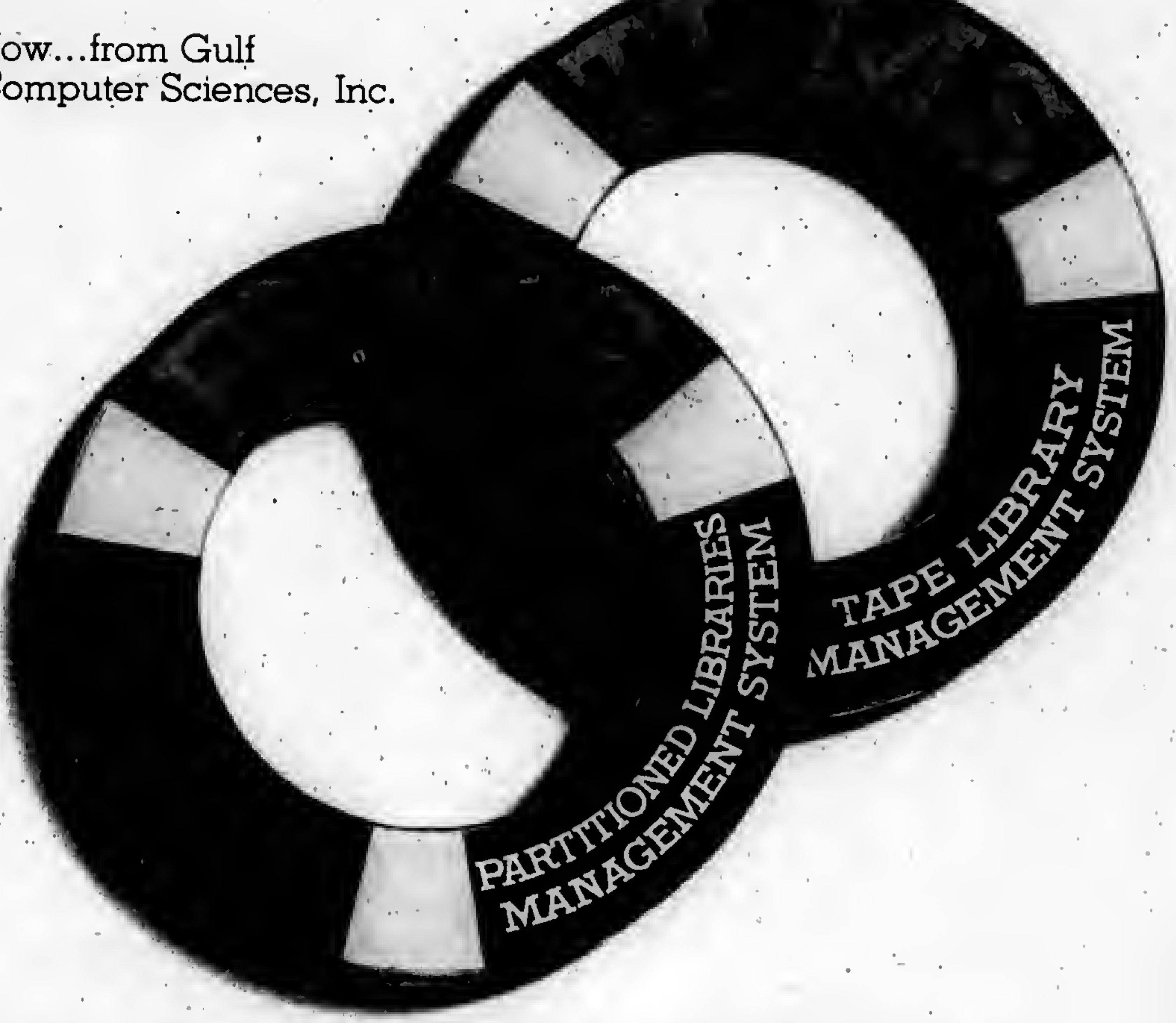

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Firm Opts for Mixed-Vendor Site

Switch From IBM 3 Ends Batch Era for Car Dealer

By Esther Surden
Of the CW Staff

LOS ANGELES – The IBM 3 was "getting to be a problem" and Barish-Cherney Chrysler-Plymouth wanted to switch to a true real-time on-line environment, so the firm decided to go to a non-IBM mini, Philip Cramer, the firm's DP manager, said in an interview here recently.

The primary function of the Microdata Corp. Reality system that now sits in Barish's parts warehouse is order entry. Orders come in over the phone, or people stop by for parts and the salespeople enter the orders on CRTs.

The system also does the general accounting functions for the firm, including the general ledger, accounts receivables and payables, Cramer said.

Payroll is handled by a bank for security purposes, he added.

The company considered almost all the major mini manufacturers before purchasing the Reality system. Data General Corp. Digital Equipment Corp., General Automation, Hewlett-Packard, Basic Four Corp., Cincinnati Milacron and Datapoint all were evaluated.

Some were dismissed because five printers could not be hooked up to the system. Others would not "customize" their systems or had little growth potential. Reality seemed to be the best choice, Cramer said.

The configuration the company chose has a 48K processor, 20M bytes of disk storage – one fixed and one removable, one tape drive and seven CRTs.

It also includes one 300 line/min printer, two Centronics printers (one of which has large print capability for the picking tickets), two DEC Decwriters and a Decision Data card reader with communications capabilities.

The entire system cost $135,000, Cramer said.

Microdata was willing to accommodate the mixed-vendor environment and the dealer-supplied software support for the card reader, Cramer said.

Barish has had the Reality system for six months and is still in the process of converting from the batch-oriented IBM 3/20 to the on-line real-time environment of the Reality system, Cramer said.

Not Easy to Convert

The conversion has not been a particularly easy one, but only because the environment is entirely different, he said. Record structure and the way of operating is completely different than the IBM batch world, he explained.

Cramer had been working with IBM gear for 18 years prior to the switch, although not all those years were at Barish.

The limited card capacity remains because it seems to be the most convenient way to process back orders and receipts, Cramer said.

"I haven't found a convenient way to bypass this" because of the quick turnaround document quality of cards, he said. The stock orders have 1,000 to 9,001 line items each.

The card reader is served by the independent vendor, he added.

The reader communicates to the Reality via an asynchronous line, but the firm is considering direct connect, Cramer said.

The order entry function on the system involves three companies – two car dealerships and a jobber. Between 450 and 500 invoices are run on the system each day and the firm prebills.

Five of the CRTs are dedicated to order entry and invoicing is run continuously from about 7 a.m. to 5 p.m. each day. This is possible because of the multiprogramming capability of the Real-

(Continued on Page 43)

Mini's Strength Seen in Its Specialization

By Esther Surden
Of the CW Staff

BOSTON – "The maxi's major strength is its general power and flexibility; the mini's strength lies in the fact that it can be specialized, play flexible roles and has a low price," Grayce M. Booth of Honeywell Information Systems said here recently.

"Most systems of the future will use both maxis and minis," she predicted, adding the day of multiple minis to replace the large general-purpose computer has not yet come.

"The necessary interconnections and the software to control these are too complex and costly," she said.

In a speech on hierarchically distributed information systems, Booth said such systems are configured around a host processor that acting as the primary processor and providing support services to satellite processors.

A satellite is usually a mini that depends on the host for some type of support or guidance, she explained.

During the evolution of such systems, the higher level members become more powerful and generalized while the lower level members become less powerful but more sophisticated, Booth said.

The major function of the maxicomputer is to act as the host, she noted. The large-scale system can handle complex transactions, produce complex reports based on information collected from the entire system and do long-range forecasting, she said.

Splitting Bases Impractical

Large-scale systems can support very large data bases, Booth said. While many are advocating the splitting of large data bases into smaller segments, it is difficult to do so because it is impractical for today's minis to handle this amount of information, she added.

Besides batch and time-sharing functions, large systems represent a flexible end-user facility for unplanned inquiries and reports, Booth said.

Minis, on the other hand, are very specialized. The mini's role is as a satellite processor, a process controller, a terminal controller or as a network switcher; a mini can also perform a variety of these functions at once, she said.

Minis handle the simple, the normal case, Booth added. They produce simple reports and support moderately sized data bases with local data only.

This local data is often a working copy of the host's data base, Booth added.

Preplanned operations, one- or two-dimentional operations and real-time processing are other functions of minis, she continued.

"Real-time processes are poorly done by maxis," Booth claimed.

The user shouldn't build a master-slave relationship between minis and the host computer, but should strive for "intelligent cooperation" between the two, she concluded.

Mini-Based Net Eases Loan Paperwork

...And They Said It Couldn't Be Done

By a CW Staff Writer

LOS ANGELES – Although the DP department said it couldn't be done, Citizens Savings and Loan Association has developed a distributed processing network with minicomputers to keep track of loan applications, according to the association's consultant, Don Deitch.

Every savings and loan is bogged down in paperwork, Deitch told a Computer Caravan workshop here recently.

"We needed a nonreiterative, nonreentry type of system that tracks a lender from the day we hear about him to the day the loan is granted," he recalled. The system also would have to give management total cash flow information.

When the distributed processing network is finally completed, it will include a system with a set of data files to keep track of individual loan applications. The files will be accessed by remote terminals via dial-up telephone lines, Deitch said.

The two host systems will exchange data bases at night so that in the morning they will have the same data base. And if one fails, the other can carry the system, he said.

Almost Novices

The system, most of which has already been implemented, was developed with little formal training in any form of computing on Deitch's part; he was a consultant hired with the mandate to upgrade the savings and loan's massive portfolio.

When the queue to the firm's IBM 360 seemed to prevent any experimentation, he decided to go outside of the computer room to do the work, he said.

Deitch knew what he wanted done and, with the use of a Datapoint 1100 system, managed to upgrade the portfolio, which meant converting low interest paying loans to higher interest loans to create more revenue.

The second thrust was to service the loans and so, with the background of the portfolio system, Deitch and his group set about developing the network.

The team built up a data base of 38 significant items. The idea was that no piece of information should have to be entered twice.

The network will provide reports on a need-to-know basis, Deitch said, so a branch manager or a district manager will get the information tailored to his needs.

When a loan is ready for approval, the system will self-audit itself against a set of management-set limits, Deitch said.

The total network costs about $7,500/mo, including personnel, two 65K Datapoint 5500 systems with two disk drives, a 300 line/min printer and 30 CRTs. Two modems were purchased separately from an independent vendor, Deitch said.

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Crime Lab Decides Security the Motive As It Picks Mini to 'Watch' Evidence

By Esther Surden

Of the CW Staff

ATLANTA – A minicomputer at the Georgia State Crime Laboratory here will soon be used to help keep tabs on evidence used in criminal trials.

The laboratory conducts autopsies, analyzes the chemical content of blood and keeps records of crime-related information.

The lab chose a minicomputer over alternative computing methods because it needs the security of an individual system, according to William S. Waldo, project manager of law enforcement systems.

"The evidence that would be logged by the system is admissible in court," Waldo stressed, so the lab doesn't want anyone to be able to say evidence has been tampered with.

Price Not Considered

After the lab had decided on a mini, a committee generated a request for proposals (RFP) without considering price: the main criteria was that a vendor be chosen which could comply with the RFP, Waldo said.

About eight vendors responded, he recalled. Some who could not supply Cobol were eliminated because the lab wanted to use a "universal language;" others simply could not meet the specs, he said.

The lab finally chose a $6,000/mo Hewlett-Packard (HP) 3000CX system.

Prior to the installation of the system, which is scheduled to become operational next month, all data was kept manually. The files became increasingly complex and the task of indexing and cross-referencing by hand was too much to handle, Waldo said.

The crime lab had asked for a system a long time ago, he added. It was bogged down in paper work, had a backlog and couldn't add enough new people to cope.

Important Function

The ability to locate evidence brought into the crime lab with only partial information will be an important function of the system.

The HP mini has 128K bytes of main memory; a 300 line/min printer; 300 card/min card reader; one 9-track, 1,600 bit/in. magnetic tape drive; two disk drives with a total of 47M bytes of storage; and six CRTs.

In addition, the laboratory plans to install eight HP Model 2640 CRT terminals throughout the state for access to the central file, Waldo said.

Car Dealer Ends One-Vendor Era

(Continued from Page 42)

ity, Cramer noted.

Every night the files are dumped onto tape and saved, he added.

Cramer does his own applications programming on the system and is using Microdata's Basic and English language to program.

It is simpler than on the IBM 3, Cramer said: "A program that took me four hours in Basic took me four months on the IBM."

The system is sophisticated, Cramer said, and includes multiprocessing and virtual memory techniques.

'Like VS2'

"It's like running VS2, except that takes 4M bytes of core," he said.

The file design is extremely "homogeneous," he added, making it simpler to work with.

Barish bought the system with growth in mind. The system can be expanded upward to accommodate its needs in the future, Cramer said.

Service from Microdata has been good, he added. The IBM service had not been very good in his area, he said.

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Sealed proposals will be received by the CDPA, 508 Robert E. Lee Building, Jackson, MS 39202, for the following data processing equipment:

Request for Proposal No. 237 for the lease or purchase of a front-end communications processor for an existing Xerox Sigma 9 computer system.

Request for Proposal No. 238 for the purchase of a Graphics Display Terminal to interface with an existing Xerox Sigma 9 computer system.

Request for Proposal No. 238 for the purchase of an IBM 370/158 CPU.

Request for Proposal No. 240 to sell on IBM 370/155 CPU.

Request for Proposal No. 241 for the least or purchase of a microprocessor capable of asynchronous communications with an existing Xerox Sigma 9 computer system.

Request for Proposal No. 242 for the lease of on-line data processing service for the cataloging of library books for the University of Mississippi Library.

Request for Proposal No. 243 General request for proposal for keyboard activated data communication terminals consisting of varying speeds and capability. Please bid keyboard-printer terminals, cathode ray tube terminals, printer devices, and graphics terminals; expected to be needed by the State of Mississippi during 1976.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Bailerd, Executive Director, Central Data Processing Authority.

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Shugart Offering Skinny Floppies

SUNNYVALE, Calif. – The Model SA800R OEM floppy disk drive from Shugart Associates has a chassis that allows two floppy drives to be mounted side-by-side in a standard 19-in. rack, the firm said.

A pair of drives can be mounted either vertically or horizontally and can be used in a desk-top version as well, the firm said, thus its nickname "the Skinny Floppy."

The drive mechanism is based on the Shugart SA800 and features single- or double-density recording capability, IBM compatibility and a proprietary ceramic read/write recording head.

The SA800R costs $490 in 100-unit quantities from Shugart at 435 Indio Way, Sunnyvale, Calif. 94086.

Reduced by $2,000/Mo

Mini Melts Steel Foundry's Electric Bill

LEBANON, Pa. – A steel foundry here is saving $2,000/mo in electric charges by using a minicomputer to control its electric arc melting furnaces.

That figure came from Loyal Slough, DP manager for Lebanon Steel Foundry, who explained the foundry's biggest power gulpers are two electric arc melting furnaces.

These giants melt down four to five tons of scrap in one and a half hours, using about 550 kilowatt hours of electricity per ton, he said.

In order to cope with utility bills, which are based on the single 15-minute period during the month in which the foundry has the highest consumption, the firm first installed a demand-limiting meter that shut down the furnaces whenever usage approached a preestablished "setpoint."

The meter controlled the furnaces to the point it limited the foundry production somewhat, Slough said, but only controlled the high heat setting and could not forecast a peak.

Mini Lowers Setpoint

The firm decided to try minicomputer control and installed an IBM 7 in August 1973 to control the arc furnaces.

"In spite of the fact we had been averaging 6,140 kilowatts demand, we established a new setpoint at 5,900" with the mini and after four weeks stabilized to 5,500 kilowatts demand for the entire foundry, Slough said.

The system has continued to hold down electrical demand, he added, despite the addition of fans, ventilators, dust collectors and other devices in the foundry.

For the first minute of each 15-minute period, the system lets the furnaces operate uncontrolled, he said. For the next four minutes it controls to 7,800 kilowatts, and for the next 10 minutes it controls so that an average of 5,500 kilowatts is not exceeded for the 15-minute period.

Sometimes demand drops by itself as a result of an operator going to lunch or taking a break, Slough added, so the system does not have to shut down the furnace. When the system does shut down a furnace, it can start it up again at the end of the period, he said.

The system also tells management what it is doing every step of the way via printouts on a console printer, he continued.

The printouts contain the date and time, setpoint, total power drawn by all the furnaces and total plant electrical consumption, he said.

The information, printed in both kilowatts and percent of total, compares usage with the peak consumption hit during any 15-minute period during the current month, Slough said.

"If we exceed our setpoint despite our efforts, we can make the new peak the setpoint for the rest of the month, if we wish, because we are going to have to pay at that rate anyhow," he added.

The System 7 also has told company officials things about the foundry's operation it didn't know before, according to Slough.

"Our highest demand for electricity is from 8 a.m. until noon, possibly because the daytime operators are fresher then.

"The computer seldom cuts off the furnaces from noon or possibly 2 p.m. until 7 a.m. the following day," he said.

VRC Rugged Memory Available for PDP-11

NORTH SPRINGFIELD, Vt. – The Model 3401 random-access bulk storage system for Digital Equipment Corp. PDP-11 minicomputers are available from Vermont Research Corp. (VRC).

The OEM system is compatible with DEC's RC11/RS-64, VRC said, and stores up to two million words.

Average access time is 8.5 msec and the transfer rate is 4.1 µsec per word, the firm said.

The system can be used in applications where shock, vibration and atmospheric contamination are present, it added.

The Model 3401 costs $21,545 in OEM quantities from VRC at Precision Park, North Springfield, Vt. 05150.

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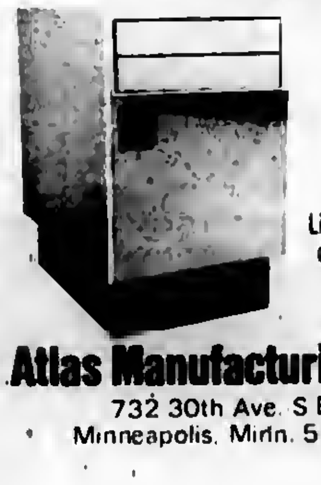

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CI Notes

Pertec to Sell Cipher

EL SEGUNDO, Calif. – Pertec Corp. has agreed to sell Cipher Data Products to an investment group led by Bill Otterson, current president of Cipher.

Terms call for a substantial part of the purchase price in cash with the balance by note along with the assumption of all obligations of Pertec in conjunction with Cipher.

"The sale of Cipher had been contemplated as a part of the reorganization of [Computer Machinery Corp. (CMC)] and completes a list of major objectives to be accomplished in conjunction with Pertec's acquisition of CMC," according to Ryal Poppa, Pertec president.

FTC Pursues Line of Business

WASHINGTON, D.C. – While the Federal Trade Commission's (FTC) effort to get 117 recalcitrant firms to fill out its line-of-business reports for 1973 was less than successful, the commission plans to file a suit soon in an effort to have the 1974 forms completed.

About 180 firms are expected to be defendants, according to the *Wall Street Journal*.

The FTC has asked 442 large companies to fill out the 1974 forms, which are "more comprehensive" than the 1973 forms.

Telefile Eyes PGI

IRVINE, Calif. – Telefile Computer Corp. is seeking to buy Peripherals General, Inc. (PGI), maker of disk systems for IBM and GE/Honeywell systems.

Telefile President S.V. Edens said PGI would probably be merged as a new subsidiary.

The move, which is subject to approval by boards and lending institutions, could lead to production of disk systems compatible with other mainframe computers, he observed.

Supershorts

Informatics, Inc. said it has sold more than $1 million in Mark IV/IMS interfaces.

– – –

Harris Corp.'s Composition Systems Division has signed a third-party leasing agreement with Trans-Union Leasing Corp. for its line of electronic systems for the printing industries.

– – –

RCA Corp. has agreed in principle to help Hughes Microelectronic Products Division and Synerteck, Inc. become alternate source suppliers for RCA's CDP 1802 8-bit CMOS microprocessor and associated peripheral integrated circuits.

Big Gains in Large Systems

Japan Increases Import of DP Systems

WASHINGTON, D.C. – The value of foreign computer systems imported by Japan increased to 51.6% of the total installed base in that country from 48.6% the year before, according to figures released by the U.S. Commerce Department.

In the year ended March 31, 1975, 2,950 foreign systems valued at $1.11 billion were delivered compared with 5,085 domestic systems valued at $1.04 billion.

The figures, compiled by the Japanese Ministry of International Trade and Industry (Miti), did not include minicomputers, process control or analog computers, on-line terminals or off-line equipment.

The largest gains made by imported equipment in the large systems category, with equipment valued at over $841,750.

In systems valued at more than $1.68 million, there were 161 foreign machines installed during the year compared with 76 domestic machines.

The category of systems valued between $841,750 and $1.68 million was more closely divided in terms of numbers between foreign and domestic, although foreign still held the lead with 150 systems compared with 145.

In terms of installed base, Japan's imported systems with values over $841,750 totaled $2.04 billion compared with domestic systems worth $1.68 billion.

By contrast, the installed base of foreign equipment with values between $336,700 and $841,750 was $603.3 million compared with the domestic base of $1.38 billion, according to the Miti figures.

Smaller in Value

Looking at the installed base by value, large foreign machines lost ground, dropping from 57.5% of the base as of March 1974 to 54.9% in March 1975.

However, medium-size machines gained, growing from 28.6% in 1974 to 30.5% in 1975.

Looking at the concentration of systems in industries, marine products led the list with a total installed base of 63 foreign systems and 23 domestic, according to the Miti figures.

Other large users of foreign systems were the finance industry, which had 3,127 foreign systems compared with 500 domestic, and security, with 100 compared with 80.

The category of associations, cooperatives and special entities had 932 foreign systems compared with 667 domestic, but the value of the domestic was nearly twice that of the foreign.

DP Forms Shipments Lead Industry Decline

ARLINGTON, Va. – Computer output forms posted the sharpest decline in shipments last year as the manifold business forms industry registered its first negative growth year, according to the International Business Forms Industries (IBFI) association.

Year-end reports indicated a decline of about 4.5% in the industry's product shipments from 1974's $2.12 billion; forms tonnage may have declined as much as 8% to 11%, Edwin Masten, IBFI research director, said.

The drop in computer output forms was affected by extensive inventory cutting, IBFI said.

Discounting also depressed sales of continuous stock and simple continuous custom forms during the last part of 1975 and has contributed to the less than expected improvement so far in 1976, according to IBFI.

The remainder of 1976 should improve; forms sales could reach $2.3 billion on a 10% real growth if discounting moderates, the association noted.

IBFI sees a gradually declining growth rate as less paper and other computer output technologies cut into the continuous forms market. Industry shipments by 1980 will top $3 billion and could reach $4.75 billion by 1985, the assocation said.

CSI Sees Electronic POS Sales Reaching $582 Million in 1980

By Molly Upton
Of the CW Staff

SAN JOSE, Calif. – Sales of electronic point-of-sale (POS) systems should grow from $200 million in 1975 to $582 million in 1980, according to a study by Creative Strategics, Inc. (CSI), a market research firm here.

Electronic POS systems were defined as those able to communicate externally through data storage media or phone lines.

Many of the more sophisticated electronic cash registers (ECR) have the potential to be upgraded to electronic POS systems, the study said. Some capture as many as 200 or more totals inside the machine, but are not connected to a computer or data collection device.

About 48,700 electronic POS terminals were shipped domestically in 1975. Shipments in 1980 should reach 110,000, CSI forecast.

Cumulative shipments of electronic POS units between 1976 and 1980 should reach 436,000 terminals, according to the report.

Outnumbered by ECRs

They will be outnumbered by ECRs, however, whose cumulative shipments in that period should reach approximately 563,000 units, the study said.

Domestic shipments of ECRs in 1975 were 48,300; by 1980 these should grow to 137,700, CSI predicted.

However, the value of ECR shipments is lower, ranking at $115 million in 1975 and $329 million in 1980, according to the report.

There should be a sharp decline in the market share of the electromechanical cash register (EMCR) from 33% to less than 1% of sales by 1980, the report said.

Sales Up $39 Million

Taking the three categories, domestic shipments were valued at $472 million or 184,000 units in 1975. This compared with $433 million or 182,400 units in 1974.

Sales for the three types of machines should improve significantly to reach a cumulative total of $3.65 billion between 1976 and 1980, according to the report.

The market for the three types of units should total $913 million in 1980 for a compound annual growth rate of 14%, CSI said.

Flat Year

CSI said 1975 was a flat year for POS manufacturers. Among the factors contributing to the slow year were a depressed retail environment, the tight money market, dissatisfaction with POS hardware, fear of equipment obsolescence and uncertainty about scanning systems, according to the study.

Several retail chains extended their POS implementation plans beyond 1975, causing a number of POS manufacturers to alter their business plans or drop out of the marketplace entirety, the report observed.

Breaking down the market by manufacturer, NCR captured about 40% of the ECR and electronic POS terminal shipments in 1975, securing the lead in overall installed base, the study said.

With over 25 competitors in the ECR segment, CSI said it expects only eight or nine to survive.

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THURSDAY, JUNE 17

8:30 am—9:50 am: REGISTRATION. Pick up your seminar materials and get ready for two days of information-packed sessions.

9:50 am: WELCOME. *Susan Alt*, Editor, *Business Insurance*; *Edward J. Bride*, Vice President, Editorial Services, *Computer World*.

10:00 am: FACILITIES PLANNING: WHAT TOP MANAGEMENT NEEDS TO KNOW. You learn what steps you can take in the planning stages to minimize computer operations risks from *Robert H. Courtney*, Director of Data Security and Privacy, IBM Corp.

11:15 am: EMERGING RISKS—CLOUDS ON THE HORIZONS. *Robert V. Jacobson*, Assistant Vice President, Chemical Bank, reviews areas of increasing risk which threaten to become major management concerns, such as theft, sabotage, physical loss, and illegal access.

12:15 pm: LUNCHEON. Take this opportunity to get acquainted with your fellow registrants. Exchange ideas and information.

1:30 pm: RISK ROUNDTABLES. Three concurrent sessions—attend the one of your choice. The sessions repeat at 3:30 pm so you can attend a total of two.

EMPLOYE DISHONESTY. *William A. Mahoney*, Vice President, Marsh & McLennan Inc., tells you how to handle a fidelity loss when the computer is involved.

AUDITING THE COMPUTER. How to make sure the computer program does ONLY what it is supposed to do . . . discussed by *Joseph J. Wasserman*, President, Computer Audit Systems Inc.

ERRORS & OMISSIONS RISKS. An examination of the many problems inherent in providing data processing services for customers, including quantifying the possible errors and omissions exposure, types of insurance available and user problems that have been experienced.

3:30 pm: RISK ROUNDTABLES. Repeat of above sessions. Attend the one of your choice.

5:30 pm: RECEPTION. Join your fellow registrants for cocktails and stimulating conversation.

6:15 pm: DINNER.

7:30 pm: NEGOTIATING THE COMPUTER CONTRACT. *Roy N. Freed* of the greater Boston law firm of Pollock, O'Connor & Jacobs tells you how a properly negotiated lease contract is one of the most effective means of obtaining relief from a problem with a computer equipment supplier.

FRIDAY, JUNE 18

9:00 am: HOW TO PREPARE FOR BUSINESS INTERRUPTION. *Paul W. Miles*, Executive Vice President, I. Berman Co., discusses the risks involved in a computer stoppage interrupting your company's operations and how you can effectively plan for recovery.

David Warren, CPCU, Partner, Warren, McVeigh, Griffin & Huntington, tells you how to fund business interruption losses through insurance and self-insurance so you get the money you need to get back in business.

10:30 am: LOSS PREVENTION ROUNDTABLES. Two concurrent sessions. Each repeats at 1:30 pm so you can attend both.

RISK MANAGEMENT: DATA TRANSPORTATION & NETWORK COMMUNICATION. *Rees S. Himes*, Assistant Vice President, Marsh & McLennan Inc., identifies and discusses various kinds and causes of losses through transporting and telecommunicating data and tells of ways to minimize and control losses.

CASE STUDIES OF COMPUTER RIPOFFS. *Donn B. Parker*, Senior Information Processing Analyst, Information Systems Group, Stanford Research Institute, takes an in-depth, eye-opening look at two examples of the computer as a tool of the corporate criminal.

12:30 pm: LUNCHEON. No speaker, so take advantage of this opportunity to discuss areas of mutual interest with your fellow registrants.

1:30 pm: LOSS PREVENTION ROUNDTABLES. Repeat of 10:30 am sessions. Attend the one of your choice.

3:30 pm: HOW TO IMPLEMENT A GOOD RISK MANAGEMENT PROGRAM. Panel members *William D. Hahn*, Principal Consultant, George Betterley Consulting Group, *Donald P. Fitzgerald*, Manager of the Management Consultant Services Division of Ernst & Ernst, and a corporate client discuss the nuts and bolts of establishing an effective and workable risk management program for data processing exposures.

4:30 pm: ADJOURNMENT.

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Canadian Service Industry Reaps $211 Million in '74

By Gordon D. Hutchison
Special to Computerworld

OTTAWA – A survey of the Canadian computer service industry showed there were 345 companies with total operating revenues of $211 million primarily engaged in providing processing, software and system maintenance, education and other computer-related services in 1974.

Another 35 companies with total revenues of $612 million were primarily engaged in providing sales, lease or rental of DP hardware services, according to figures compiled by Statistics Canada.

In addition, an estimated $100.1 million in revenues was reported by 381 companies and institutions that provide services as a secondary activity.

The report detailed information on the service bureau portion of the industry separately from sales, rental and leasing. The 1974 report should serve as a good base for future comparisons.

In terms of equipment, the Canadian service bureau industry maintained 206 computers of various sizes and 1,150 terminals, of which more than half operated at speeds of less than 1,200 bit/sec.

Establishments involved in the sale, lease or rental of hardware had 148 computers on lease and 886 terminals.

The largest proportion of these computers (83) had a monthly rental of $1,000 to $5,000, followed by rentals of $5,000 to $20,000 per month (58 computers). Only 13 computers had monthly rentals of $50,000 or more.

More than one-third of all service bureau revenue came from over-the-counter processing and one-quarter from software packages and services, the report showed.

The largest single customer of the service bureau industry was the manufacturing sector, which accounted for 20.3% of the total operating revenues of $211 million, followed closely by financial institutions (15.5%) and wholesalers and retailers (15.7%).

Government Business Small

Despite the concerted move by government to contract its service bureau requirements to industry, all levels of government combined accounted for only 19% of revenues, or $39.7 million, in 1974.

International News

Of total direct expenditures for DP hardware – $221.8 million – some 26% or $56.9 million went for goods manufactured in Canada. Rented equipment, however, was almost totally imported, with a mere .42% of income coming from the rental of Canadian-made equipment.

As it is more likely that larger processors would be rented or leased and smaller dollar items sold, it is reasonable to guess that Canadian companies are making the small computers, some peripheral equipment and data communications gear.

For the 35 establishments engaged primarily in providing sales, lease or rental of DP equipment, the total operating revenue was derived from processing and software ($45.9 million); sale of equipment and all other goods purchased for resale ($164.8 million); sale of goods manufactured by Canadian companies ($57 million); and lease or rental of equipment and goods acquired for lease or rental ($304.6 million).

Financial institutions were the largest single sector of the economy operating their own computer gear. Their exact participation is not known because of the security restriction of the Statistics Act.

The manufacturing sector, the largest known sector, accounted for 16% or $98 million of sale, lease and rental income. If all government activity was aggregated, it would have accounted for 13.5% of revenue, or $76.7 million, plus whatever contribution crown corporations would make to the total.

Next to processing services, establishments providing computer services as a secondary activity generated the largest portion of their income from the single rental of their hardware.

Of those engaged in providing services as a secondary activity, manufacturing companies accounted for $19 million, government for $16 million, finance for $15 million and education for $10 million.

When combined with other organizations providing services as a secondary activity, these organizations realized total operating revenues of $100 million in 1974.

Japan Seen Topping All But U.S. as User If Miti Program Met

TOKYO – Japan will become the world's second largest computer user by 1980 if a five-year plan developed by the Ministry of International Trade and Industry (Miti) reaches fulfillment, according to a recent article in *The Japan Economic Journal*.

The plan calls for Japan to have 75,000 digital general-purpose computers installed at the end of fiscal 1980 compared with the 36,400 installed at the end of fiscal 1975.

This represents an installed base worth $18.43 billion by 1980, which is a 2.4-fold rise from the base installed by the end of 1975, the journal said.

Miti expects installations of large-scale computers to increase at an average annual rate of 20.7% during the five-year period, boosting large-scale computers' percentage of the total installed base to 62.7% by 1980, compared with 58.5% at the end of fiscal 1975, the journal said.

Miti suggested stress be placed on developing programs to help jobs of computer programmers.

It considers upgrading of computer utilization a "must" for coping with the future economy and society, which will become more information-intensive, the newspaper said.

Thus, Miti will support domestic computer makers through its subsidization policy and other measures, it added.

Miti calculated the target number of computers installed from recent trends in computer utilization and the progress in the evolution of the information-intensive society in the U.S., which is the world's largest computer user, the journal said.

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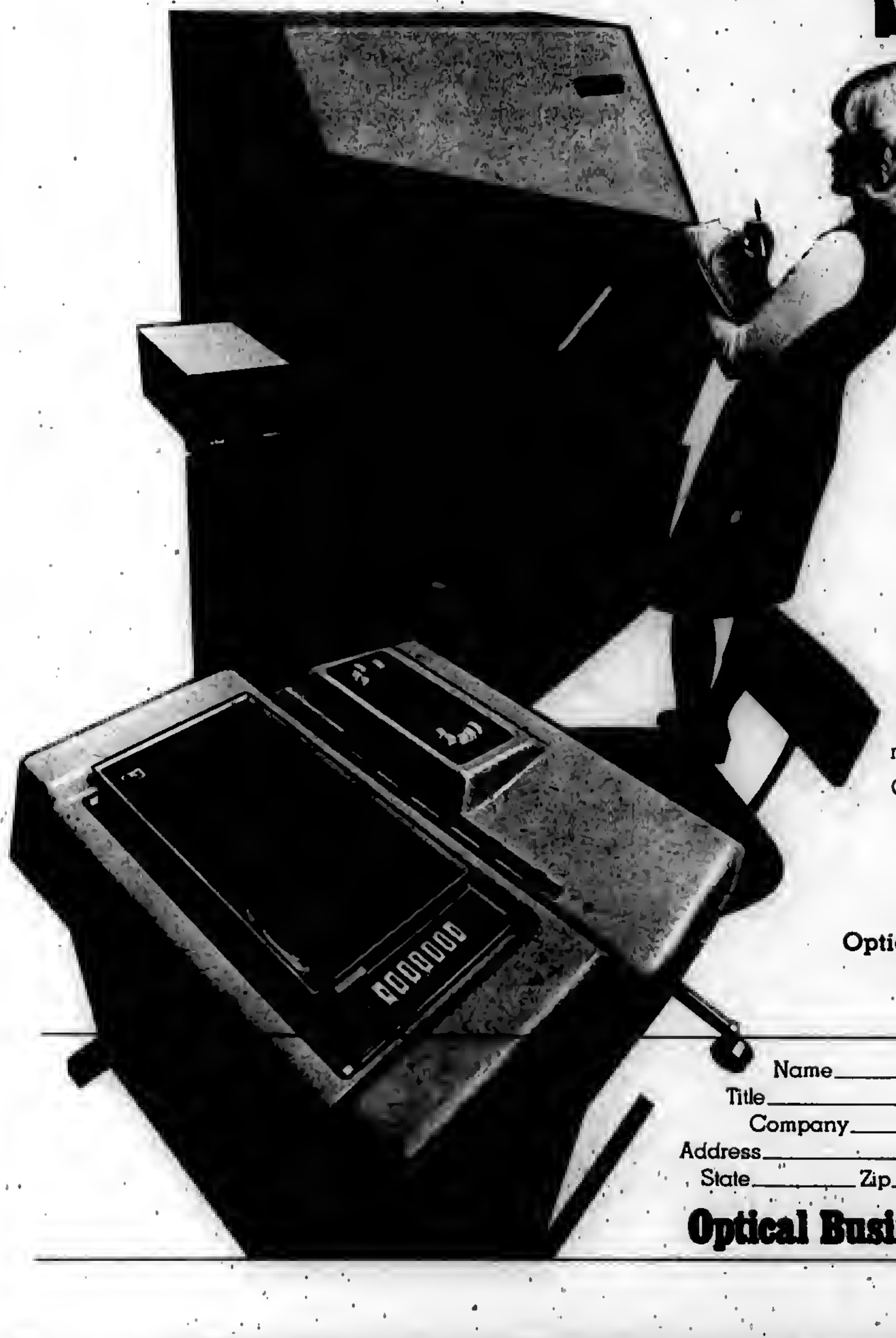

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Customers 'Good Advisers'

Incoterm Products Reflect User Demand

By Molly Upton

Of the CW Staff

NATICK, Mass. – Incoterm Corp.'s recent product announcements reflect customer demands, according to M.R. Clement Jr., vice-president of marketing.

M.R. Clement Jr.

"Customers have been good advisers," he added.

The additional features of Local Forms Control (LFC), a terminal-oriented file management capability, as well as floppy and cartridge disk capacities reflect the increasing trend to do much of work off-line, he said.

Incoterm was founded to develop programmable terminals and, as a result, has developed its own CPU architecture and software that are oriented to moving data quickly, Clement observed.

He defined a terminal as intelligent if it reacts to a real-time situation.

In all Incoterm's products, programs reside in core since this offers better protection than solid-state, he said.

Incoterm is seven years old and now has about 700 employees. During 1975, sales reached $32 million, up 50%.

"I don't know how we'll beat this one," Clement commented.

Market Promising

The market for intelligent terminals is growing at a 40% rate and indications are that the market is increasing for the independents, according to Jean Tariot, the company's president.

The integrity of the independents has been pretty well established and the firms are doing well, he said. They are also coming out with new applications as the central software improves and there are smarter users around, he said.

In estimating the independents' market size, Tariot noted four companies – Datapoint, Four-Phase, Sycor and Incoterm – probably shipped about $200 million in 1975. The independents' market is therefore about twice that size, he said..

"What counts to us is the market available," or the users willing to look to independents, he said.

In installing a system, Incoterm will typically do the first set of programs, taking turnkey responsibility for installation, Tariot said.

Software included in the myriad of recent product announcements were Basic, Level I and II data entry software that is said to permit the use of English, and Program Development and File Management System.

As if setting its house in order before adding still more products, Incoterm revamped its product designations into the SPD 10 and SPD 20 families.

The 10 family includes two series, the 20 and 25, while the 20 family now has three series: 20, 30 and 40. (See story on Page 24).

With these products, Incoterm said it has reduced the cost per operator station to below industry norms.

Long known for its products in use by airlines, shipments in 1975 to airlines accounted for less than 20% of the firm's business, Clement said. However, on an installed basis, the airlines are the largest segment, Tariot added.

CW Photos by M. Upton

Jean Tariot

Bookings from banks were good last year, Clement said.

In addition to its 10 and 20 family, Incoterm also has a 7000 terminal for bank tellers as well as a license from Transac to manufacture automatic tellers.

Other major market areas are railroads, hospitals, law enforcement agencies and state and federal government organizations.

Orders & Installations

J.G. Lane, Inc. of Los Angeles has installed Logabax keyboard send/receive hard-copy terminals for its time-sharing system.

Broyles & Broyles, Inc. of Fort Worth, Texas, has ordered a PDP-11/70 from Digital Equipment Corp.

Nashville Bridge Co. has installed a Univac 90/30 system, including four 8416 disk storage subsystems, a 0770 printer and a 0717 card reader.

The Baylor Co., a division of Sedco, Inc., has ordered an offshore data collection, reduction and display package called DVS-10 from Polaris Computer Systems for a mobile drilling platform environment.

Acme Foundry & Machine Co., Inc. of Blackwell, Okla., has installed a Burroughs B700.

Bath Iron Works Corp. has installed the first of four Loadmax-200 digital loading computers from Raytheon Co.

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Goetz Cites Bundling

IBM Policy Discouraged Operating Systems Mart: ADR

By Nancy French
Of the CW Staff

NEW YORK – If IBM had priced operating systems separately when it unbundled its applications programs and services, many independent software firms would have developed and sold operating systems for use on IBM systems, according to Martin A. Goetz, senior vice-president of Applied Data Research, Inc. (ADR).

Given the complexity of an operating system and the resources it takes to build one, it would not be a "prudent" business decision to attempt to sell one against IBM's "free" systems even if a firm could make a better one, he observed.

In 1965, however, IBM's operating systems were relatively simple; many independent software firms had both the talent and the financial resources to build them, Goetz said in testimony on behalf of the Justice Department in its antitrust suit against IBM being tried here.

ADR, for example, had a great deal of experience with sort programs and built seven or eight such systems for various equipment manufacturers and government agencies. ADR also built the first Cobol compiler for RCA, he said.

Today, IBM's operating systems are so complex it would take a consortium of companies to compete, he said, but if it were profitable, companies could build them.

Charges 'Inefficiency'

Goetz came down hard on what he called the "inefficiency" of IBM's operating systems, saying some had hundreds and thousands of errors. Further, these operating systems used far more computer overhead than necessary, he said.

IBM was capable of building better operating systems and, with competition from firms such as Computer Science Corp., Computer Usage, Informatics and ADR for example, IBM would have been forced to do so, Goetz testified.

Goetz also attacked IBM on "slippages" which he said he had seen occur between the time an operating system was announced and the time it was delivered. This seriously interfered with users' planning, he said.

If a user wanted to correct an error in an operating system or obtain a new feature, he had to move to the latest release of the operating system, he added.

Goetz also bit IBM for what he called "account control." IBM exercised this control by pressuring middle management to buy new products by selling top management on going with IBM, he said.

Couldn't Provide Details

Under cross-examination, Goetz was pressed for names of users, dates and numbers which in most cases he did not seem to be able to provide, saying he relied for details on ADR employees and articles from technical and trade publications.

However, despite the fact that Goetz brought in published articles to support his general statements on operating systems and users' difficulties with them, IBM attorney Paul Dodyk refused to permit any to be introduced into evidence.

Instead, Dodyk hammered away at Goetz's credibility, forcing him to admit he himself was not familiar with such things as the code used to implement IBM's OS/VS 1 or OS/VS 2 or the criteria its designers considered in its development.

Although he had criticized the efficiency of these operating systems under direct examination, Goetz admitted he had never measured their efficiency and there was no standard for determining how much core an operating system should be expected to use.

He also indicated he had no knowledge of operating systems other than those built by IBM.

Even ADR 'Slipped'

On the subject of "slippages," Goetz admitted that even ADR slipped on its delivery schedules, and ads showed it had slipped on nearly every version of Autoflow.

Questioned on how ADR corrects errors in its software products, Goetz said unless the problem is "catastrophic," it asks users to wait for the next release, just as IBM does.

As for account control, Goetz admitted his firm never even tried selling to top management.

Although he testified IBM had solicited help from independent software companies in building the Isam portion of DOS, and ADR received such a solicitation in 1966, Goetz could not produce the document.

Repeatedly Questioned

When Dodyk suggested IBM's records showed no such invitations to bid on this work had ever been issued, Goetz said he could have been wrong – that perhaps it had been the Isam used in the OS operating system.

Because the defense attorneys found much of Goetz's testimony "contradictory," Dodyk repeatedly posed the same questions hoping to produce a set of consistent answers for Judge David N. Edelstein's consideration. Edelstein is the sole arbiter of the case.

Schultz Resigns Post As Decision Data Head

HORSHAM, Pa. – Loren A. Schultz and Frank H. McPherson have resigned their positions as president and vice-president of marketing respectively at Decision Data Computer Corp.

Winfield Shiras, a partner in the consulting firm of Grisanti & Galef, Inc., was appointed acting chief executive officer of the firm.

Richard L. Schwab, formerly vice-president of sales and service, was named vice-president of marketing.

In addition, Richard F. Taylor, vice-president of operations, was designated acting chief operating officer.

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ADR Claims Software Industry Record With Installation of 5,000th Product

PRINCETON, N.J. – Applied Data Research, Inc.'s (ADR) Software Products Division has installed its 5,000th software product, at The Kiplinger Washington Editors, Inc. in Washington, D.C.

This is a record in the number of products installed by any independent software firm, according to John Bennett, ADR president.

The company was formed in 1959 to provide software services and in 1965 began to market software products.

The 5,000th order was for Roscoe, an on-line programming system. ADR's The Librarian system was installed at Kiplinger in 1974

Reminiscing about the background of ADR and the software industry, Bennet called the software industry one of the great growth stories of the 20th Century.

Educated forecasts are that the next 10 years will see 25% to 30% growth each year. ADR anticipates at least 1,000 new customers a year, Bennett noted.

"The history of ADR's Software Products Division is the history of the industry," he said.

Even though the Industry had its recognized beginning in 1969, ADR was developing software products as far back as 1965. While early software products were sold by people who were essentially technicians by mail, over the phone or by one technician talking to another, ADR sought out potential users, educated them to the uses of its products and ensured proper followthrough, Bennet said.

Bennett believes ADR's follow-up program is unique among software manufacturers. After installing its product and training people within the user organization, ADR stays in contact throughout the years, he observed.

Every account has a technical support representative as well as a salesman assigned to it, he said.

During the recent economic crunch – which the software industry did not escape – ADR did not retrench, but hired additional support people, he added.

Products Used Worldwide

ADR's international division, in operation since 1967, has its own technical field support people to assure the same level of service as U.S. customers receive, Bennett said.

ADR claims many "firsts" in the industry. These include:

- It was the first company to market software products nationall (1965) and internationally (1967).
- It was the first to receive a patent on a software product (Autoflow II in 1970).
- It was the first to have a software product listed on the General Services Administration Schedule (1967).
- It was the first independent software firm to reach $30 million in software product sales (1975) and the first to initiate a formal follow-up program for all installations.

Martin Goetz, director of the Software Products Division, said the independent software companies have established an enviable reputation with products that are innovative, well-supported and well-documented.

"This is their only business and they excel at it," he said.

Mini Makers Want OEM Reps To Be Sales, Applications Experts

By Dennis A. Fletcher
Special to Computerworld

Minicomputer vendors seeking OEM representatives in the turnkey business market are looking for a combination of seasoned sales personnel and experienced applications technicians, according to a survey of five such mini makers.

The survey polled Basic/Four, Cincinnati Milacron, Digital Equipment Corp., Hewlett-Packard Co. and General Automation.

In a spontaneous listing of characteristics felt to be most desirable in an OEM representative, three firms listed in-house software applications expertise and an existing competitive sales force.

Two vendors said the rep should be able to capitalize to the needed credit line.

Other criteria listed by respondents were marketing experience in small business systems; the ability to penetrate new industry areas; the courage to face risk; and business experience of three to four years.

Since these criteria were provided without prompting, it is likely that several of the respondents would have checked off these attributes had they been presented a list.

Vendors surveyed recognize the highly competitive nature of the small business turnkey mini market and the need for a strong sales force in order to succeed.

"It's a door-slamming, tire-kicking market out there," one vendor stated.

In addition, the vendors are looking for service bureaus, software houses and systems houses to supplement their rather meager supply of applications software.

In some cases, vendors want to supplement their technical force, which is inexperienced in the applications of the small commercial marketplace.

Three-Year Agreements

Those considering making OEM agreements with a mini vendor should be sure the agreement period is long enough – preferably at least three years – to ensure that the first-year investment will be recouped with a reasonable return before the agreement comes up for renegotiation.

There usually is nothing in the agreement that will bind the vendor to renew the agreement.

Fletcher is with Fletcher & Associates, a consulting firm in Altadena, Calif. He conducted the survey, whose results were given at a seminar in Los Angeles for the Association of Data Center Owners and Managers.

Earnings Reports

ADVANCED MEMORY SYSTEMS
Three Months Ended March 26

	1976	1975
Shr Ernd	$.52	$.18
Revenue	9,289,000	7,681,000
Tax Cred	651,000	210,000
Earnings	1,357,000	439,000
6 Mo Shr	.98	.30
Revenue	19,556,000	15,184,000
Tax Cred	1,208,000	360,000
Earnings	2,517,000	745,000

BURROUGHS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.61	a$.59
Revenue	405,273,000	365,213,000
Earnings	24,270,000	a23,371,000

a-Restated for accounting change.

BEEHIVE MEDICAL ELECTRONICS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.16	$.12
Revenue	2,978,097	2,158,570
Earnings	148,552	110,813
6 Mo Shr	.31	.23
Revenue	5,492,887	4,282,130
Earnings	289,321	213,104

COMPUGRAPHIC
Three Months Ended March 27

	1976	1975
Shr Ernd	$.95	$.79
Revenue	22,590,000	18,803,000
Earnings	1,840,000	1,446,000
6 Mo Shr	1.79	1.51
Revenue	44,226,000	36,735,000
Earnings	3,441,000	2,757,000

CONRAC
Three Months Ended March 31

	1976	1975
Shr Ernd	$.85	a$.56
Revenue	27,626,000	21,009,000
Earnings	1,145,000	a753,000

a-Restated.

DATA DOCUMENTS
Three Months Ended March 31

	1976	1975
Shr Ernd	$1.66	$1.78
Revenue	18,349,299	15,898,030
Spec Cred	.....	2,000
Earnings	777,562	836,428
6 Mo Shr	3.31	3.45
Revenue	36,474,756	31,559,510
Spec Cred	.....	5,000
Earnings	1,553,702	1,621,156

HONEYWELL
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.61	.....
Revenue	648,365,000	$595,884,000
Tax Cred	1,004,000	.....
Earnings	13,553,000	1,071,000

a-Restated for accounting change.

ITEL
Three Months Ended March 31

	1976	1975
Shr Ernd	$.34	$.22
Revenue	56,100,000	38,200,000
Earnings	2,700,000	2,100,000

MEMOREX
Three Months Ended March 31

	1976	1975
Shr Ernd	$1.59	$.35
Revenue	79,419,000	6,625,000
Tax Cred	3,794,000	575,000
Earnings	9,083,000	1,583,000

MOSTEK
Three Months Ended April 2

	1976	1975
Shr Ernd	$.14	$.08
Revenue	12,573,731	14,962,895
Earnings	580,290	341,504

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Safeway Stores Incorporated

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Send resume in confidence to:

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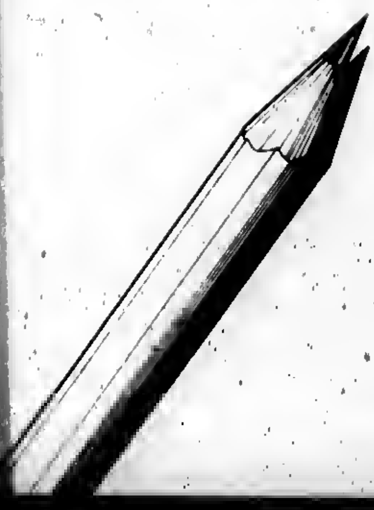

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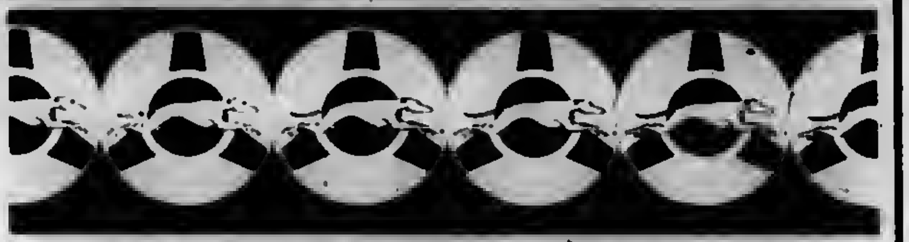

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A Pre-Bid Conference will be held on Wednesday, May 26, 1976, at 10:00 a.m., in the 1st Floor Auditorium of the COB. Bid opening will be in Room 114 of the COB on Friday, June 11, 1976 at 2:00 p.m.

The Invitation to Bid will be available, after May 10, in Room 114. Bid Bond of $3,000 will be required.

For further information, contact the Montgomery County Purchasing Office – Mrs. M. Weaver, Purchasing Agent – 279-1466.

Prime Quarter Earnings Jump Sevenfold

FRAMINGHAM, Mass. – Prime Computer, Inc.'s first-quarter earnings increased more than sevenfold on a 78% rise in revenues for the period ended April 4.

The quarter's results are "on plan for making our 1976 forecast," according to President Kenneth G. Fisher.

"I continue to believe the combination of a strong economy, a strong industry demand and a dedicated organization will assure meeting our projections for the year," he stated.

The projections include sales of over $18 million and earnings of more than $2 million with gross margins of better than 50%.

During the quarter, earnings jumped from $52,000 or 3 cents a share in the year-ago period to $365,000 or 16 cents a share.

Tax credits were $177,000 in the 1976 quarter compared with $27,000 in the 1975 period. Income before credits also rose sevenfold.

Revenues climbed to nearly $4 million from $2.2 million in the year-ago period. During the quarter the firm began shipments of its largest system, the Prime 400.

Among Prime's objectives for 1976 are completing reorganization and doubling the size of the domestic sales force, generating a higher proportion of total sales in the U.S. and increasing emphasis on business systems in market segments not dominated by IBM, Fisher said in the annual report.

Plans call for engineering and manufacturing to develop new models and additional methods for handling large data files.

Prime will not require outside capital in excess of that available through its existing bank line, Fisher said. Last year the firm increased its line of credit with the First Pennsylvania Bank of Philadelphia. That line, for $7 million, expires Dec. 31, 1977.

The company plans to more than double its facility here with a 70,000 sq-ft expansion.

EMM Finds First Period 'Encouraging'

LOS ANGELES – "Financial results for the first quarter of 1976 were encouraging," Trude C. Taylor, Electronic Memories & Magnetics Corp. (EMM) chairman, said here recently.

"Although revenues for the period were off 12% from a year earlier and off 6% from the fourth quarter of 1975, operating profits were restored," he said.

The operating results before special credits were $706,000 compared with the year-ago loss of $197,000.

Earnings, aided by a $3.8 million gain after taxes on the sale of a portion of its holdings of Sycor, Inc., totaled nearly $4.2 million compared wtih a loss of $394,000 in the year-ago period.

However, after dividend requirements on preferred stock, the earnings were $3.9 million or 72 cents a share compared with a loss of $657,000 or 12 cents a share.

Revenues dropped to $20.8 million from $23.7 million in the same period of 1975.

"Order input for most of our products and, in particular, core memories and permanent magnets continued an upward trend during the first quarter," Taylor said.

"We expect this trend will continue as we benefit from the recovering economy and by more increases in capital equipment manufacturing rates.

"We continue to be pleased with our semiconductor memory operations. We are finding excellent demand for the Semi 4K bit static memory components and memory systems.

"The manufacturing rate of our end-user add-on memories compatible with the IBM 370/158 computer is increasing. The 4K Semi is the memory device utilized in this product," he said.

EMM's bank debt was fully paid with the cash proceeds from the Sycor stock sale.

Tax Credit Dip Hurts Data 100 Net

MINNEAPOLIS – Although Data 100 Corp.'s income before special credits rose in the first quarter over that of a year ago, earnings failed to keep pace because of a smaller tax credit in the 1976 quarter.

Earnings for the period totaled $946,000 or 20 cents a share compared with nearly $1.4 million a year ago.

Tax credits were $126,000 compared with $580,000, respectively.

Revenues, including $5 million in nonrecourse sales to third-party leasing companies, rose to $29.3 million compared with $20.9 million in the same quarter last year.

The first quarter reflected for the first time the inclusion of the acquisition of Iomec, Inc.

Shipments of terminal equipment to end users during the quarter were up over those of the 1975 first quarter, according to Edward D. Orenstein, Data 100 president.

The firm's order rate and backlog have been increasing steadily since year-end 1975, he said.

The Keybatch product now accounts for about 50% of net shipments in North America, he added.

NCSS Increases Year Earnings 18%

NORWALK, Conn. – National CSS, Inc.'s (NCSS) earnings rose 18% in the year and 39% in the fourth quarter ended Feb. 29 compared with year-ago periods.

For the quarter, earnings reached $620,000 or 54 cents a share compared with $447,000 or 41 cents a share in the same period last year.

Revenues totaled $9.3 million compared with $7.9 million.

During the year, NCSS earned nearly $2.2 million or $1.95 a share compared with $1.8 million or $1.67 a share last year.

Revenues rose to $35.6 million compared with $32.6 million last year.

Sycor Results Up In First Quarter

ANN ARBOR, Mich. – Sycor, Inc. scored increased levels of revenue and earnings during the first quarter ended March 28.

Revenues rose 41% to $15.8 million compared with $11.2 million for the comparable 1975 period.

Earnings before benefit of tax loss carryforward combined to $1.2 million or 42 cents a share from the $835,000 or 30 cents a share in the year-ago quarter.

Earnings edged upwards to nearly $1.24 million or 42 cents a share compared with $1.2 million or 44 cents a share in the same period a year ago, when there was a $382,000 tax credit.

On March 30 Sycor completed an equity offering to the public of 541,026 shares of common stock with proceeds after expenses of $13.7 million.

New Registrations

TEKTRONIX, INC., 14150 S.W. Karl Braun Drive, Tektronix Industrial Park, Beaverton, Ore. 97077, an electronic display and measurement equipment firm, filed to register 400,000 shares of common to be offered for sale by M.J. Murdock Charitable Trust through underwriters headed by Lehman Brothers, Inc., One William St., New York, N.Y. 10004.

APPLIED DEVICES CORP., 60 Plant Ave., Hauppauge, N.Y. 11787, maker of computer-controlled data entry devices, filed to register 202,000 shares of common to be issued in conjunction with the merger of Applied Devices and Datatrol, Inc., with each outstanding share of Datatrol common (other than those shares presently held by Applied Devices) being converted into about .18519 share of Applied Devices common stock. No underwriters are involved.

INFORMATION INTERNATIONAL, INC., 5933 Slauson Ave., Culver City, Calif. 90064, a computer graphics data input and output systems manufacturer, filed to register 91,500 shares of common to be exchanged by certain shareholders for limited partnership interests in Vance Sanders Exchange Fund at an exchange rate to be determined by the market price of the stock at the time of the exchange. No underwriters are involved.

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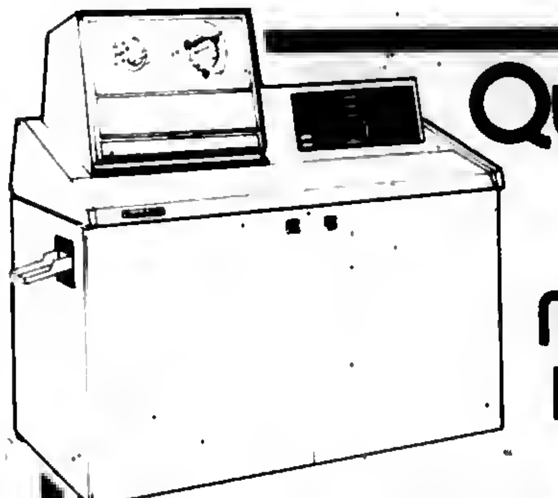

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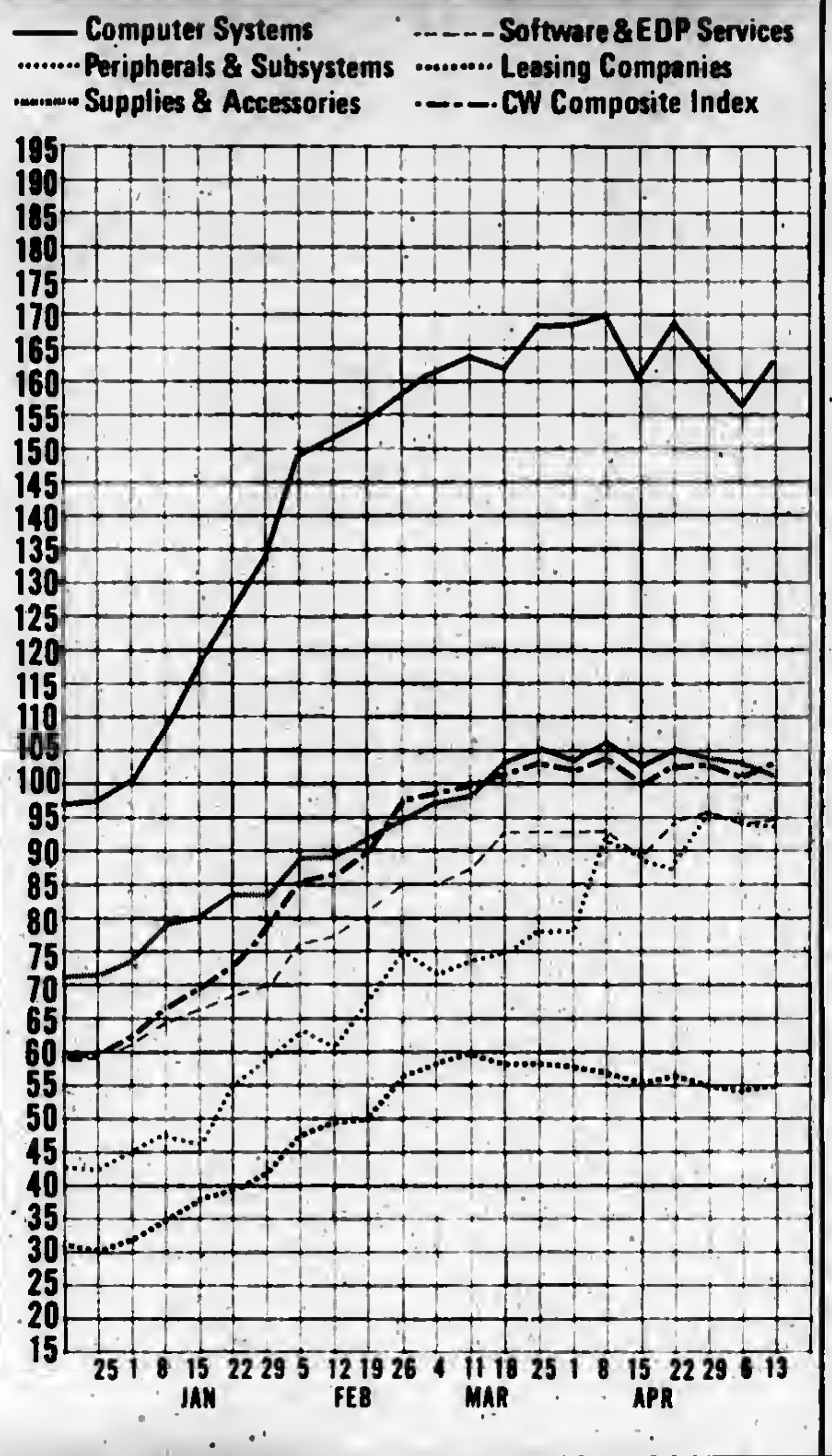

Earnings Reports

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Revenue	$4,840,746	6,007,177
Earnings	(916,992)	443,785

HAZELTINE

Year Ended Dec. 31

	1975	1974
Shr Ernd	$.67	.....
Revenue	85,258,000	$96,602,000
Spec Item	a100,000	b(680,000)
Earnings	1,308,000	(2,360,000)
3 Mo Shr	1.13	.....
Revenue	24,457,000	25,505,000
Tax Cred	100,000	.....
Earnings	2,216,000	2,006,000

a-Tax-loss carryforward. b-Cumulative effect of accounting method change for preproduction and computer software costs.

KEYDATA

Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.10	$.04
Revenue	145,000	56,000
Tax Cred	127,000	46,000
Earnings	272,000	102,000
6 Mo Shr	.18	.05
Revenue	7,346,000	6,412,000
Tax Cred	224,000	61,000
Earnings	481,000	136,000

MCI COMMUNICATIONS

Nine Months Ended Dec. 31

	1975	1974
Revenue	$18,373,000	$3,980,000
Loss	a19,945,000	23,108,000

a-After a $1.5 million gain from sale of interest in CML Satellite Corp.

MICRODATA

Three Months Ended Feb. 29

	1976	1975
Shr Ernd	$.34	$.12
Revenue	6,255,064	3,417,502
Tax Cred	.....	18,000
Earnings	587,471	193,664
6 Mo Shr	.59	.03
Revenue	11,157,097	6,859,237
Tax Cred	.....	18,000
Earnings	1,001,288	45,959

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 12, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 12 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	102 3/8	+ 1/2	+0.4
O	COMPUTER AUTOMATION	10- 19	17	+ 5/8	+3.8
N	CONTROL DATA CORP.	18- 27	23 1/8	+1 3/8	+6.3
N	DATA GENERAL CORP	40- 60	55 1/2	+2 1/4	+4.2
O	DATAPOINT CORP	24- 45	44 3/4	+5 1/4	+13.2
O	DIGITAL COMP CONTROL	2- 4	3 5/8	+ 1/4	+7.4
N	DIGITAL EQUIPMENT	138-181	169 1/8	+2 3/8	+1.4
N	ELECTRONIC ASSOC.	2- 5	3 1/8	- 1/8	-3.8
A	ELECTRONIC ENGINEER.	7- 16	14 5/8	0	0.0
N	FOXBORO	28- 41	40 3/8	+1 3/8	+3.5
O	GENERAL AUTOMATION	5- 11	8 3/4	- 7/8	-9.0
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	95-117	111	+4 5/8	+4.3
N	HONEYWELL INC	34- 56	46 3/8	+2 5/8	+6.0
N	IBM	227-272	257	+7	+2.7
O	MANAGEMENT ASSIST	1- 3	2 1/4	+ 1/8	+5.8
O	MEMOREX	18- 33	30 1/4	+1 1/4	+4.3
O	MICRODATA CORP	10- 26	22 1/4	+1 3/4	+8.5
O	MODULAR COMPUTER SYS	9- 13	10	+ 3/4	+8.1
N	NCR	24- 31	29 1/4	+2 1/2	+9.3
O	PRIME COMPUTER INC	4- 11	9 1/2	+ 1/4	+2.7
N	PERKIN-ELMER	20- 27	20	- 1/4	-1.2
N	RAYTHEON CO	45- 54	54 3/8	+3 1/4	+6.3
N	SPERRY RAND	40- 50	49 1/4	+1 5/8	+3.4
O	SYCOR INC	20- 31	28 1/2	+4	+16.3
A	SYSTEMS ENG. LABS	6- 10	8 3/4	+ 1/4	+2.9
N	VARIAN ASSOCIATES	13- 17	15 1/4	+1	+7.0
A	WANG LABS.	11- 20	13 1/2	+ 3/8	+2.8

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 12 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 3/4	0	0.0
A	COMMERCE GROUP CORP	2- 3	2 5/8	- 1/8	-4.5
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	- 1/8	-6.6
M	DATRONIC RENTAL	1- 1	3/4	0	0.0
A	DCL INC	1- 1	3/4	-	-7.7
N	DPF INC	5- 7	5 5/8	- 3/8	-6.2
O	EDP RESOURCES	1- 1	1	0	0.0
A	GREYHOUND COMPUTER	3- 8	7 1/2	+ 3/8	+5.2
N	ITEL	6- 13	12	+ 5/8	+5.4
N	LEASCO CORP	6- 14	11 5/8	- 7/8	-7.0
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	NPG INC	1- 1	3/4	0	0.0
A	PIONEER TEX CORP	6- 9	7 7/8	+ 1/4	+3.2
N	U.S. LEASING	7- 12	10 1/2	+ 1/2	+5.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 12 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/2	0	0.0
A	APPLIED DATA RES.	2- 3	2 7/8	0	0.0
N	AUTOMATIC DATA PROC	54- 67	65 1/4	+3 5/8	+5.8
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	3 5/8	- 1/4	-6.4
O	COMPUTER DIMENSIONS	3- 7	5 3/4	+ 7/8	+17.9
O	COMP ELECTION SYSTMS	5- 9	8 3/4	+1 1/4	+16.6
O	COMPUTER HORIZONS	1- 2	1 3/4	0	0.0
O	COMPUTER NETWORK	2- 6	5 1/4	- 1/8	-2.3
N	COMPUTER SCIENCES	4- 8	6 3/4	+ 1/2	+8.0
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	3- 6	3 1/2	- 1/8	-3.4
O	COMSHARE	2- 7	5 3/4	- 1/2	-8.0
O	DATATAB	1- 1	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	13 1/8	-1 1/4	-8.6
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	3	- 1/8	-4.0
O	KEYDATA CORP	3- 5	2 1/2	- 1/4	-9.0
O	LOGICON	4- 4	3 7/8	- 1/8	-3.1
A	MANAGEMENT DATA	1- 3	2 1/2	0	0.0
A	NATIONAL CSS INC	13- 25	20	+ 3/4	+3.8
A	ON LINE SYSTEMS INC	18- 22	20 1/4	+1 1/8	+5.8
A	PLANNING RESEARCH	3- 5	3 1/4	0	0.0
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	3 1/8	+ 1/4	+8.6
O	REYNOLDS & REYNOLD	13- 21	18	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	19- 28	27	+2	+8.0
A	UPS SYSTEMS	3- 5	3 3/4	+ 1/4	+7.1
N	WYLY CORP	3- 7	4	- 1/4	-5.8

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 12 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 1/2	+ 1/2	+5.5
O	ADVANCED MEMORY SYS	4- 10	8 1/2	+1 5/8	+23.6
N	AMPEX CORP	5- 8	7 3/4	+ 1/2	+6.8
O	ANDERSON JACOBSON	2- 4	3	- 1/8	-4.0
O	BEEHIVE MEDICAL ELEC	3- 6	5 5/8	+ 3/8	+7.1
A	BOLT, BERANEK & NEW	7- 10	8 1/4	+ 3/8	+4.7
N	BUNKER-RAMO	5- 7	5 7/8	+ 3/8	+6.8
A	CALCOMP	4- 7	4 3/4	+ 1/4	+5.5
O	CAMBRIDGE MEMORIES	2- 6	3 5/8	- 1/4	-6.4
N	CENTRONICS DATA COMP	20- 36	32	-2 1/2	-7.2
O	CODEX CORP	22- 42	36 1/2	+3	+8.9
O	COGNITRONICS	1- 1	7/8	- 1/8	-12.5
O	COMPUTER COMMUN.	1- 5	4 1/2	- 3/8	-7.6
O	COMPUTER CONSOLES	4- 6	5 1/4	- 1/4	-4.5
A	COMPUTER EQUIPMENT	1- 3	2	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	1 1/4	0	0.0
O	CONTEN	4- 9	8	+ 1/8	+1.5
N	CONRAC CORP	20- 25	23 3/8	- 1/8	-0.5
O	DATA ACCESS SYSTEMS	1- 3	3 1/4	0	0.0
O	DATA 100	7- 13	11	+1 5/8	+17.3
A	DATA PRODUCTS CORP	5- 11	9 7/8	0	0.0
O	DATA TECHNOLOGY	1- 2	1 3/4	0	0.0
O	DATUM INC	1- 2	2	0	0.0
O	DECISION DATA COMPUT	2- 4	1 3/4	- 3/8	-17.6
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
O	DIVAN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 7/8	+ 1/8	+4.5
O	FABRI-TEK	1- 1	7/8	+ 1/8	+16.6
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/4	+1 3/8	+16.4
N	HARRIS CORP	34- 47	44 3/4	+ 5/8	+1.4
A	INCOTERM CORP	9- 20	14 1/4	+ 1/2	+3.6
O	INFOREX INC	3- 7	5 3/8	+ 1/8	+2.3
O	INFORMATION INTL INC	10- 18	14 7/8	0	0.0
O	INTEL CORP	69-109	75	+4	+5.6
A	LUNDY ELECTRONICS	4- 7	4 1/2	- 1/4	-5.2
O	MSI DATA CORP	3- 7	6 5/8	+ 1/4	+3.9
A	MILGO ELECTRONICS	15- 20	16 3/4	- 7/8	-4.9
N	MOHAWK DATA SCI	3- 7	5 1/2	+ 3/8	+7.3
O	OPTICAL SCANNING	1- 3	1/2	0	0.0
O	PENRIL CORP	1- 3	2 5/8	+ 1/8	+5.0
A	PERTEC CORP	3- 8	6	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	6 1/2	- 1/2	-7.1
O	QUANTOR CORP	4- 5	4 3/4	- 1/8	-2.5
O	RECOGNITION EQUIP	6- 11	10 1/8	+1 1/8	+12.5
N	SANDERS ASSOCIATES	6- 11	10 5/8	+ 5/8	+6.2
O	SCAN DATA	2- 4	2 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	12 3/8	+1 3/4	+16.4
O	T BAR INC	6- 10	6 3/4	0	0.0
O	TALLY CORP.	4- 6	4 7/8	+ 1/4	+5.4
O	TEC INC	3- 5	4	- 1/4	-5.8
N	TEKTRONIX INC	45- 60	60	+3	+5.2
N	TELEX	2- 5	3 3/8	- 1/8	-3.5
O	WANGCO INC	11- 22	16 1/4	- 1/4	-1.5
O	WILTEK INC	2- 2	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 12 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	2 3/4	- 5/8	-18.5
O	BALTIMORE BUS FORMS	4- 5	4 1/4	- 1/4	-5.5
A	BARRY WRIGHT	6- 10	8	- 3/8	-4.4
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	33- 42	36 1/4	- 1/4	-0.6
O	DUPLEX PRODUCTS INC	17- 24	17 7/8	- 1/8	-0.6
N	ENNIS BUS. FORMS	6- 8	6 3/4	+ 1/8	+1.8
O	GRAHAM MAGNETICS	9- 13	9	+ 1/2	+5.8
O	GRAPHIC CONTROLS	13- 19	18 1/2	+ 1/4	+1.3
N	3M COMPANY	55- 65	59	0	0.0
O	MOORE CORP LTD	46- 51	47 1/4	- 1/4	-0.5
N	NASHUA CORP	11- 17	16 7/8	+ 3/8	+2.2
O	STANDARD REGISTER	16- 19	16 1/2	+ 1/4	+1.5
O	TAB PRODUCTS CO	5- 8	7 1/4	0	0.0
N	UARCO	21- 25	22 5/8	- 3/8	-1.6
O	VANIER GRAPHICS CORP	5- 8	6 1/2	- 1/4	-3.7
A	WABASH MAGNETICS	4- 8	6 3/8	- 3/8	-5.5
N	WALLACE BUS FORMS	19- 25	22 1/2	- 3/8	-1.6

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NEWSPAPER

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.
year May 24, 1976 Vol. X, No. 21

CW Photos by M. Upton

Where are they now? With the exception of one of the four men shown above in pictures taken shortly before U.S. vs. IBM went to trial a year ago, they're all still in court. Nicholas Katzenbach, IBM general counsel, and Thomas Barr, IBM lead attorney (both left) are still squaring off against Raymond Carlson, lead Justice attorney (far right). Joseph Widmar (far right) is back in Washington.

U.S. vs. IBM: One Year Gone

NEW YORK – The trial of the U.S. government's antitrust suit against IBM celebrated its first anniversary here last week.

Unfortunately, court was not in session to permit Justice Department attorneys, IBM counsel and the judge hearing the case to acknowledge the event last week.

But the following numbers may serve to commemorate what began on May 19, 1975 and to give some indication of how much has been accomplished in this first year in court.

When the trial recessed on Thursday, May 13, 133 days spread over 35 weeks had been spent in court. A total of 29 witnesses had taken the stand on behalf of the government, and one has yet to complete his testimony.

The record of the proceedings for the past year now numbers 19,179 pages.

As of May 13, the government had entered 565 exhibits into evidence and IBM had put 523 exhibits before Judge David N. Edelstein.

When the government finishes presenting its case to the court – perhaps three years from now, some observers believe – IBM will begin its defense. The corporation has 402 people, including some 134 DP users, on its witness list; indications are, however, that it will call only 200 of these.

Although the U.S. vs. IBM. suit is seven and a half years old, its first year in court suggested the case may still be in its infancy.

AT&T Trying Hard to Sell Bill That Would Overturn FCC Competition Rulings

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T has launched a concerted lobbying effort to sell the merits of the Consumer Communications Reform Act to its stockholders and members of Congress.

The campaign began shortly after the first sponsor of the proposed legislation presented it in the House of Representatives on March 10 [CW, March 22].

Seven days later, AT&T chairman John deButts sent a letter to Bell stockholders urging them to make their views known to their elected representatives in Congress.

The letter said: "We do not ask that you agree with us on the issues." This statement followed a presentation on why competition and interconnection, fostered by the Federal Communications Commission (FCC) are bad for the country in general and the AT&T stockholder in particular.

The deButts letter was followed by an offer to shareholders of "further information and background material on the need for the legislation" that could be obtained free of charge by writing to a special address at AT&T headquarters at 195 Broadway, New York, N.Y.

Asked how much this effort has cost AT&T, a spokesman said "so far we have spent about $50,000 mainly for brochures and handout materials."

In addition, AT&T has "realigned the duties of some people who have generally been dealing with these issues in regulatory and congressional hearings. On the legislative effort itself, we probably have less than 10 people spending most of their time on the subject," the spokesman said.

This is the first in a series of articles describing the efforts being expended behind the scenes to inform Washington legislators and others about the pros and cons of the Consumer Communications Reform Act of 1976, now pending in both houses of Congress.

DeButts' plea to the stockholders at the annual meeting and the threats about the declining value of their investments did not fall on deaf ears. Within days the mail to congressional legislators from constituents back home picked up significantly. Many of the letters urged support for the Consumer Communications Reform Act, as deButts had suggested.

Following common practice in such cases, the letters were forwarded to the Common Carrier Bureau of the FCC with notes from the congressmen and senators asking that the bureau staff answer the questions raised.

"This is a counterproductive effort because these letters contain little new information," one bureau staff member said. Many of the letters made the same general points in support of AT&T policies and in disagreement with FCC decisions, particularly those creating the specialized common carriers and allowing the interconnection of customer-provided equipment.

One week ago the volume of mail reaching the commission was about 15 letters per day and one source said it was his opinion the peak was yet to come.

The Common Carrier Bureau is not

(Continued on Page 6)

Sabotage, Fire Among Threats

Federal Systems Unduly Vulnerable: GAO

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – "Many federal data processing assets and much valuable data are not protected properly" from threats of sabotage, theft, fire and flood, according to a recent General Accounting Office (GAO) report.

The report showed the 9,000 computers in the Federal government are "not only . . . frequently allowed to function without proper controls, but . . . they are dangerously vulnerable to terrorist activity," according to Sen. Abraham Ribicoff (D-Conn.), who requested the study.

The Senate Government Operations Committee headed by Ribicoff will investigate the matter, the senator said, and staff sources indicated hearings might be held next month.

"Catastrophic losses to government-sponsored data processing installations, such as the loss of human life, irreplaceable data and equipment, have occurred," the GAO study reported.

No Contingency Plans

At the same time, however, an investigation into 28 separate installations found "less than half . . . had developed and put into operation contingency plans to provide for continuity of operation if a loss occurred.

"The impact from losses at data processing installations which did not have contingency plans could interfere seriously with efficient and economical operations of government, have an immeasurable impact on individuals and organizations relying on government data and result in costly reconstruction efforts," the GAO report warned.

The GAO report estimated the govern-

(Continued on Page 4)

Federal DP Crimes Reach $2 Million

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – Computer-related crimes in the Federal government have caused monetary losses of over $2 million and violated the privacy of individuals about whom computer records are kept, according to a General Accounting Office (GAO) report.

That's apparently not the whole picture. The GAO admitted this represents just the tip of the iceberg since "agencies do not customarily differentiate between computer-related and other crimes" and "there may be a large number of crimes which have not yet been detected or reported."

The majority of the 69 crimes uncovered by the GAO in the wide-ranging

(Continued on Page 4)

High Fraud Potential Uncovered In Audit of SSI DP Operations

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – In the absence of adequate controls, employee fraud could further undermine the already inefficient operation of the Social Security Administration's (SSA) newest federal welfare program, investigators probing the problems of Supplemental Security Income (SSI) found here recently.

Their audit, released this month by the Department of Health, Education and Welfare's (HEW) audit agency, stated that in one of SSA's busiest areas – Region IX, which covers California, Nevada and Hawaii – "internal controls at the district offices were not adequate to prevent processing fictitious or unauthorized SSI payments."

Meanwhile, the SSA finished compiling figures for SSI's first 27 months of operation and reported the program's clients have been overpaid by $622 million.

Implemented by SSA in 1974, SSI was created by Congress in 1972 to federalize state and county care for blind, disabled and aged adults. The program was added to the agency's regular workload of Social Security and veterans' benefits payments.

The HEW audit of the California region showed SSA employees in the area's district offices could be tempted to be dishonest because they have "unlimited access to computer terminals."

It would not be difficult for employees

(Continued on Page 6)

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy: $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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User Charged Discrimination

HIS, Service Bureau Settle Out of Court

By Molly Upton
Of the CW Staff

NEW YORK – An out-of-court settlement was recently reached by Integrated Computer Services, Inc. (ICS), a service bureau, and Honeywell Information Services, Inc. (HIS) after ICS' counterclaim was amended.

The terms of the settlement were not disclosed, and neither Honeywell nor ICS would comment on the settlement.

ICS's counterclaim raised the issue of a vendor's right to discriminate among users of its equipment.

The amended counterclaim asked $5.1 million in compensatory damages and not less than $5 million in punitive damages.

The filing sought to permanently enjoin HIS from failing to provide the same maintenance and availability of spare parts to users who lease or purchase HIS gear from sources other than HIS as it does to those who procure their equipment from HIS.

ICS originally filed suit against HIS because, it claimed, an HIS-recommended upgrade to two H3200s which failed to perform as specified resulted in lost business and increased expenses totaling $2 million [CW, Feb. 16].

HIS then filed an action for $1.2 million plus interest which it said ICS owed for payment of promissory notes.

'Bait-and-Switch' Tactics

ICS' amended counterclaim described the "bait-and-switch" and "lock-in" tactics it claimed were employed by HIS in selling the service bureau the dual H3200s.

Breaking down the compensatory damage claims, ICS sought $2 million for costs incurred in acquiring and preparing for the new system and for loss of its existing system, which it traded in to HIS.

These costs and the agreement to purchase the system were the result of benchmarks which ICS said HIS misrepresented and performed in a "wanton and reckless fashion."

Lost Profits Claimed

ICS also sought $1.2 million in compensation for lost profits and lost customers. It charged these losses occurred as a result of HIS' failure to supply trained and qualified personnel to design and write JCL program instructions, as HIS had orally agreed to do.

Charging HIS with fraud, the service bureau wanted $750,000 for lost processing time, lost customers, additional overhead and costs incurred because of HIS' alleged promises the H3200s would double throughput and no programming changes would be necessary.

These promises, ICS said, were not included in the written contract.

ICS asked another $750,000 on grounds the equipment it finally agreed to take was different both from that upon which the proposed representations were made and the gear that ran the benchmarks.

HIS told ICS the equipment contained the same characteristics as originally represented, the service bureau's filing said.

ICS was "locked in" to the new system by virtue of the noncancelable contract and the trade in of existing equipment, the counterclaim said.

The service bureau sought $225,000 in compensation for costs incurred when it reverted to its original Mod I operating system and also for the expense involved by HIS' alleged attempts to prolong ICS' efforts to use the H3200s.

ICS also requested $185,000 for costs it had incurred and expected to incur in obtaining maintenance and spare parts for its third-party system.

HIS indicated it would offer maintenance only if ICS paid $130,000 it said ICS owed, ICS said. ICS stated it did not owe this amount.

Third-Party Charges

The counterclaim further alleged HIS has restricted the resale of HIS gear to third parties by discriminatory maintenance and spare parts policies to users of third-party gear.

Through its refusal to make spare parts available, HIS precluded competing companies from offering preventive and remedial maintenance for such equipment, ICS charged.

Prior to the settlement, Raytheon provided service to ICS' computers, an ICS spokesman said.

TRW Signs to Support, Maintain Singer Hardware and Software

By Nancy French
Of the CW Staff

CLEVELAND – TRW, Inc. and The Singer Co. have signed a "definitive" agreement turning over maintenance and customer support functions for the Singer Business Machines (SBM) Division to TRW.

The arrangement includes a pledge by TRW to continue production of the Singer System Ten at Singer's Cogar plant in Utica, N.Y., as well as to provide software maintenance and in some cases enhancements for systems now in use.

Since there is some overlap in TRW and Singer's peripheral products, some questions still have to be answered as to which peripherals will be available. Further, TRW has not yet said how long the System Ten will be manufactured, what arrangement will be made for field support or whether a point-of-sale pollable terminal will continue to be available for retail users, according to Don Sandford, Forum Executive director.

Forum is the Singer users group.

So far Forum members are generally pleased with answers received from TRW and Singer and are convinced the firms are giving users information as quickly as they can, Forum President Carlton Mathews said.

Overseas, users will be supported by International Computers Ltd. (ICL) according to another "definitive" agreement signed recently.

On or about Oct. 1, TRW is expected to decide what Singer assets the firm will need to continue supporting Singer users, and these assets will be bought from Singer, a TRW spokesman said.

According to a memorandum Forum received from TRW and Singer, DMF.2 Release 1 will be available about June 1 depending on the results of field tests which, to date, "have been good," the firm said.

This release will support magnetic tape Liocs and includes resolution of more than 40 software error notices generated from Release H, the memo said.

DMF 2.0 multivolume pool software will be available for release with the Model 21 processor in August pending results of field test, according to the joint memo.

Further, a home office systems and support organization has been set up in Wayne, N.J., for development and support of SBM software. Software teams have been established to support SPA and CAS Type 1 operation system software and retail software.

The SPA 2.0 general accounting release will be available within two weeks.

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GAO Finds 14 of 18 Federal DP Sites Exposed to Fire

WASHINGTON, D.C. – In its evaluation of the security measures used by government installations (see story on Page 1), the General Accounting Office (GAO) visited 18 DP centers in the U.S. and 10 overseas.

Fire hazards were the main source of security breaches, the GAO study found.

Threatening conditions included combustible paper supplies and/or magnetic tape files stored in computer rooms at 14 installations.

Portable extinguishers were the only available fire protection in three DP centers, the GAO said, and at one installation not even these were available.

Twelve installations neglected to periodically clean below the raised flooring on which computers were placed, another fire hazard. At six locations, computers were in operation in rooms where master electrical power shutdown controls were not easily accessible at exit points, the GAO reported.

Flood hazards constituted another area of concern. The GAO found computers at 10 installations operating in areas where overhead water or steam pipes (excluding sprinkler systems) existed with inadequate provision for drainage.

In two centers, computers were in basements, exposing them to potential flooding conditions.

The potential for sabotage was another weak point at many of the installations visited. Vendor service personnel were not supervised while on the premises of seven DP centers, the investigation discovered.

Five installations did not control in-house service personnel while they were in the computer areas, and three locations were deemed possible targets for vandals by the GAO investigators.

Susceptibility to theft or misuse endangered security at five locations where remotely accessed computer systems were in operation without software to detect improper or erroneous attempts to access the computers or data files involved.

Fourteen of the 18 sites lacked formal contingency plans to ensure continuity of operations in an emergency, the study found..

Agency Says Federal Systems Unduly Vulnerable

(Continued from Page 1)

ment currently spends over $10 billion annually for DP activities, but warned the consequences of potential losses resulting from lax security measures could be far greater than that figure.

"Of more importance than the concern over the monetary value of these assets is the centralization and concentration of data in computerized environments, which increases the potential for major losses or misuses," the report noted.

For example, Ribicoff said, "It is impossible to estimate the effects on millions of our elderly citizens whose livelihood depends on Social Security should the computer be destroyed."

But "the potential threat is not limited to Social Security," he added. "In terms of federal revenues, for instance, imagine the havoc that would result from the destruction" of computers processing federal taxes.

'General Lack of Concern'

Of the 28 installations studied by the GAO, at least 14 were found susceptible to fire hazards; 10 were poorly located in case of floods; at least seven were susceptible to sabotage; five were susceptible to theft or misuse; and 14 lacked contingency plans to deal with any of the possible problems.

In general GAO attributed "the poor security measures to a general lack of concern for a comprehensive plan to provide effective security at a reasonable cost."

It noted the National Bureau of Standards (NBS) developed guidelines for physical security and risk management in 1974, but pointed out "no policy statement has been issued . . . regarding the application and use of the guidelines" by the Office of Management and Budget, which has responsibility for the area.

"We believe that the NBS guidelines as modified by our suggestions will provide the necessary means to structure a sound program and could go a long way in improving the conditions we found," GAO said.

"However, use of the NBS guidelines is not mandatory and they apply only to new installations or those which are improving their computer systems," it added.

DP Crimes Uncovered by GAO Only Tip of the Iceberg

(Continued from Page 1)

report did not involve sophisticated attempts to use computer technology for fraudulent purposes, but rather were uncomplicated acts such as altering input.

The GAO report did not point out, however, that most sources indicate the more sophisticated types of computer manipulations are usually harder to detect and therefore may remain hidden for longer periods of time.

Most Involved Input

Out of the 69 cases uncovered by the GAO, 62% involved persons perpetrating fraudulent input. Supply systems are "particularly vulnerable to fraudulent input," the GAO noted.

In one case, "a perpetrator used a computer terminal to ascertain the location and availability of items desired by outside conspirators," GAO said.

"Once he located those items, the perpetrator caused the system to prepare fraudulent requisitioning documents. Then he used the documents to obtain the items he wanted, took the items from the installation and sold them to the outside parties," the agency explained.

"Although the total amount of property stolen through computerized supply systems cannot easily be determined, the value of one such theft in our case files was about $53,000. Another loss of over $300,000 was averted" when discovered "accidentally," the GAO said.

In other incidents, the individuals involved prepared fraudulent input that caused systems to make direct payments to individuals or businesses as payroll, social welfare or compensation transactions, the GAO said.

In one case, a government employee helped automate an accounting system and, during the process, introduced fraudulent payment vouchers into the system.

"The computer could not recognize that the transactions were fraudulent and issued checks payable to fictitious companies set up by the employee and his accomplices," the GAO said, noting payments of over $100,000 were made in this particular case.

Another such fraud was discovered after an anonymous phone tip, but only after the perpetrator had gotten away with $90,000 to $250,000 by entering fictitious claims in a social welfare system.

Money Not Only Victim

But, the GAO was quick to point out, "computer-related crime does not always lead to direct monetary losses.

"The manager of a non-federal computer center processing personal information [for the government] was able to steal some of this data and sell it to outside parties who were not authorized to use it.

"Although the government did not lose any money, the privacy of individuals whose data records were involved was violated," the report noted.

In all, fraudulent direct payments accounted for 27 of the crimes studied by the GAO; 28 cases involved fraudulent inventory/supply actions; eight cases involved the unauthorized altering of personnel records; facilities were used for personal benefit (such as a theft of time on a computer system) in four cases; and sabotage of operations accounted for two of the cases.

In every case reviewed, the incidents were directly traceable to weaknesses in system controls," the GAO said, adding "these weaknesses were the result of deficient systems designs, improper implementation of controls by operating personnel or a combination of both."

In all of the cases, the managers involved had placed primary emphasis on "making their systems operational; control was not emphasized."

To overcome the problem, the GAO suggested "management should give attention to controlling systems as well as to implementing them. Managers should continuously assess operations to insure a proper balance between performance of systems and control over assets."

Other Measures Suggested

Other measures the report called for to control computer-related crime in government included:

- "An organizational plan that segregates the duties of individuals to minimize their opportunity for misuses or misappropriation of the entity's resources.
- "A system of authorization and record procedures adequate to provide effective accounting control over assets, liabilities, revenues and expenses.
- "An established system of practices to be followed for each duty and function of the organizational departments.
- "An effective system of internal review. This includes an internal audit staff that has training adequate to review and evaluate computer-based system controls and that does such reviews both when systems are being designed and after they have become operational.
- "Analyses of crimes to pinpoint the internal control weaknesses that may have facilitated them."

DP Students Recover Fees After N.Y. Action

NEW YORK – Students at a computer training school which closed in January 1975 and left them in various stages of study will share $20,000 recovered under a performance bond in an action brought by the New York State Department of Law.

The proceeds of the bond will be distributed to 28 men and women whose claims range from $125 to $2,475, according to a spokesman for State Attorney General Louis J. Lefkowitz.

The bond was issued by the American Insurance Co. as surety for International Computer Institute, Inc. of New York City, which closed on Jan. 6, 1975 after a federal tax lien was filed against it, the spokesman explained.

if

Given Good Chance of Passage

Senate Gets Bill Creating Data Bank of Federal Grants

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – A bill that would create a data bank of all federal domestic grants was voted out of the Senate Government Operations Committee and is expected to reach the floor this week.

Proposed jointly by Senators Edward M. Kennedy (D-Mass.) and William V. Roth Jr. (R-Del.), the bill calls for a computerized system that would maintain data on all existing federal grants as well as assist in determining whether a local community is eligible for any particular one of them.

Companion legislation has been introduced by Rep. Charles Rose (D-N.C.) in the House of Representatives, where it is being considered by Rep. Jack Brooks' Government Operations Committee.

The bills' passage was given a good chance of success by Washington observers.

The Senate bill provides for a system that is virtually an extension of one which the Department of Agriculture has used successfully to assist small communities interested in that department's rural development grants.

However, the majority of federal grants are described in thick catalogs that take hours and days to wade through, according to Kennedy.

And even when local officials have chosen the grants for which they would like to apply, they don't actually know whether their communities would be eligible for the funds, he added.

The Senate Government Operations Committee heard testimony recently describing how fast and economical the system proposed by Kennedy could be.

Paul Kugler, director of the Plans and Program Staff in the Department of Agriculture's Rural Development Service, where a small-scale grants data base is already in operation, told the committee a computer-search of the programs available could be run in about 10 minutes at a cost of $6.

A manual hunt for the same information could take as long as 40 hours and cost about $250, he said.

Agriculture set up its rural assistance data base because "we felt the need to develop such a system to fulfill our mandate, "which is to help rural communities," Kugler said.

"As a consequence, we worked with the Agricultural Stabilization and Conservation Service to develop computer software for the data base and developed a model in about three months," he added.

Could Work With Agriculture

The system was completed within a year, according to Kugler, at a cost of the salaries of two and a half people and $20,000 in computer time.

Kugler believes the Agriculture Department's system could be expanded to fulfill all the requirements of the Kennedy-Roth bill at a cost of $300,000, including the time of twelve staff members.

"We already have about 600 programs in our system, and about 400 more would have to be added. Incrementally, it wouldn't be much of a job cause we've already done the hard part," he said.

Maintaining the system would cost about $300,000 a year, he estimated, because there are more than 1,000 different assistance programs and the conditions on some of the programs change from week to week.

Kugler said he thinks even the smallest communities are now ready for a data base because of the proliferation of terminals in recent years.

The system operated by the Rural Development Service is available to users via the Service Bureau Co. and General Electric Timesharing networks under a licensing agreement. If the Kennedy-Roth bill is passed, the grants data base would be accessible the same way, Kugler indicated.

However, if an official in a local community wants to access the Rural Development Service data base only once, "we can run it for him here free," he said, and have hard-copy results in his hands within 10 days.

Requests for this free one-time service should include the name of the community, the county name and a clear statement of the problem. They should be addressed to the Administrator, Rural Development Service, Department of Agriculture, Washington, D.C. 20250.

Grosch Wins Term As ACM President

NEW YORK – With a plurality of the 9,000 votes cast after a hotly contested election, Dr. H.R.J. Grosch has won a two-year term as president of the Association for Computing Machinery (ACM).

Other candidates for the top post were Peter J. Denning and Carl Hammer.

Although only 30% of the association's 30,000 members cast ballots in this election, that was about 2,000 more votes and a "much better percentage" of the membership than has voted in the past, an observer noted.

Daniel D. McCracken had an easier time winning the association's vice-presidency. He had a clear majority of the votes cast for that position. G.G. Dodd won a close race to become ACM's new secretary.

The new slate takes office July 1, according to an ACM spokesman.

In other contests, association members chose Susan H. Nycum, Anita Cochran, Raymond E. Miller and Robert L. Ashenhurst to be council members at large.

At the same time, regional council seats went to Howard L. Morgan (Allegheny), Marshal Yovitz (East Central), Thomas D'Auria (Greater New York), William W. Cotterman (South East) and Evelyn A. Swan (Southern California).

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Justice Refutes Charge by IBM That Use of FBI Unconstitutional

By Edith Holmes
Of the CW Staff

NEW YORK – The U.S. government has refuted charges that Justice Department use of Federal Bureau of Investigation (FBI) agents to interview IBM's witnesses in the antitrust case now on trial is unconstitutional [CW, May 17].

In a 24-page memorandum filed with the court here last week, attorneys for the Department of Justice stated: "IBM, recognizing the current special concern by all three branches of the government for the rights of innocent third parties who may be involved in security investigations, has attempted unsuccessfully to bootstrap its way into a constitutional issue."

The government, through affidavits from Department of Justice and FBI personnel and in arguments, sought to demonstrate that the use of FBI agents to interview IBM's trial witnesses is a usual and normal practice employed by other civil-litigating divisions in the Justice Department in addition to the antitrust division.

"Because the object of the government and the court is a just, prompt resolution of the issues in this case, we propose to the court that all witnesses be informed of ground rules governing the interview of witnesses by the opposing party," the government's memo said.

IBM Advocates

Responding directly to the affidavits submitted with the IBM papers from former attorney generals and a deputy attorney general, the government noted two out of the three were made by men who are currently advocates for IBM.

Nicholas deB. Katzenbach, who served as attorney general in the mid-60s, is now vice-president and general counsel for the corporation, and Warren Christopher, who was deputy attorney general from 1967 to early 1969, is currently employed by the Los Angeles law firm of Omelveny & Myers, which is part of IBM's legal defense team.

The third affidavit by former attorney general Ramsey Clark, under whose administration U.S. vs. IBM was filed, represents "pure speculation," according to the government. Clark's statements "about what he would have done while attorney general are based solely on the representations made to him by defendant's counsel," attorneys with the Justice Department said.

Urging the court to recognize "the flimsy character" of IBM's arguments against the use of the FBI, the lawyers for the government argued emphasis should be placed on the central issue of this case – the monopolization charges – rather than on sideshows like this one.

They stated that the sole purpose of the interviews was to obtain information relevant to the trial from these people. IBM's right to a fair trial is not affected by this use of the agents, the government claimed.

Thus far, the conduct of the FBI agents has been consistent with the regulations under which they normally operate, the Justice Department memo added.

In an affidavit accompanying the government's papers, one agent said that if a prospective witness contacted for interview in any antitrust litigation asked that such a meeting not take place, that fact would be reported to the antitrust division either in memo or report form.

"When an individual evidences a reluctance to be interviewed, no effort is made to persuade the person to consent to further interview," the agent said. "No list or index is maintained by the FBI of those individuals who agree to be interviewed, and no list or index is maintained by the FBI of those individuals who refuse to be interviewed."

Judge David N. Edelstein, who is hearing the case without a jury, will reach a decision on the matter by June 2.

IBM Cuts Memory Prices

ARMONK, N.Y. – IBM has cut the purchase price of a variety of products from its Data Processing Division (DPD) and General Systems Division (GSD).

The reductions range from a minimum of 4% for 370/115 memory to a maximum of 35% for memories from GSD, the corporate announcement said.

DPD reduced purchase prices on expanded memory models of a number of products utilizing Mosfet memory technology. This memory is offered with the 370/115, 125, 158 and 168 systems and with the 3704 and 3705 II communications controllers.

The decreases reflect cost reductions including improved manufacturing techniques, IBM said. The purchase price reductions for expanded memory range from 7% to 35%.

The effect of these changes on a 370/115-2 with 160,000 bytes of memory is a reduction of approximately 4%; on a 370/168-3 with 4M bytes it is approximately 5%

In addition, purchase prices on the IBM 2880 block multiplexer channel and some associated features were reduced by 30%.

GSD lowered purchase prices on expanded memory models of the 3/8, 3/12 and 3/15 systems, the System 32 and the 5100 portable computer, which utilize Mosfet memory technology. The purchase price reductions for expanded memory range from 10% to 35%.

In addition, purchase prices were reduced by 10% to 15% for CPUs and some associated features of the 3/6 and 3/10, System 7, the 1130 and the 1800 data acquisition system.

All price changes are effective immediately, a spokesman added.

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Audit Finds Fraud Potential in SSI Operation

(Continued from Page 1)

to change the address of an SSI recepient who died rather than remove the person from the payment schedule, according to the audit.

At the same time, the audit found, the region's system of internal controls does not provide adequate accountability for cash items received at the district offices.

Thirdly, the study noted, "the system for periodically redetermining recipients' eligibility was backlogged to the extent that it was not effective for assuring that accurate payments were made to eligible individuals."

And a "significant" backlog of local or one-time payments had yet to be entered into the computer system, HEW auditors said.

No Fraud to Date

While the auditors found no evidence of fraud to date, they acknowledged "detection would be difficult and there is no assurance such activities have not taken place."

The HEW report recommended SSA separate, or specialize, payment functions at its district offices so more than one person would be required to make case changes. The agency has commissioned a "central office work group" to study means of further securing the computer system.

The major problems in the California region were attributed by the auditors to insufficient staffing at the district offices, computer system limitations and malfunctions and other planning and operational flaws for which SSA headquarters, and not the field offices, were responsible.

The auditors said they would issue separate audit reports on federal/state liability relating to the federal administration of SSI payments in California, Hawaii and Nevada.

Noting these reports will show 44% to 56% of the sample claims examined in these states contained errors, HEW stated, "The erroneous overpayments and underpayments resulted from a combination of circumstances and it was not feasible to determine either the dollar amount or the rate of occurrence for errors directly caused by operational weaknesses at the district offices."

At the same time, "corrective action needs to be taken at the national level," the report added. HEW auditors recommended SSA implement effective internal controls and operating procedures at the district office level "with particular emphasis on the processing of repayments, eligibility redeterminations and manual payments processing."

Placing responsibility for automated processing and recordkeeping at the agency's headquarters, they stated "SSA at Baltimore should also intensify efforts to resolve computer system limitations and reduce the occurrence of malfunctions."

SSA has sent some 1,065 temporary employees and 150 full-time employees to California to ease the understaffing problem. New money controls are said to have been implemented.

Meanwhile, the agency's computer system in Woodlawn, Md., is being audited by the General Accounting Office (GAO) and under fire by at least two congressional committees.

At a meeting earlier this month of the House Ways and Means Oversight Subcommittee on the problems encountered with SSI, Rep. Charles A. Vanik (D-Ohio) expressed his concern for the potential for employee fraud in light of this and other HEW audit reports of several SSA regions and recent reports by the GAO on computer-related crimes and the need for management to provide better protection for federal DP facilities (see related stories on Page 1).

Part of a series of SSA system audits now underway by HEW, the California study focused on the performance of the SSI between January and July 1974, which were the first six months of the program and the only time period of its operation that has been subjected to extensive investigation.

AT&T Trying Hard to Sell Bill

(Continued from Page 1)

equipped to handle large volumes of mail, but two staff members have been assigned to fill the congressional requests with the aid of automatic typewriters. Much of the mail has to be answered with a form letter due to limitations of time and manpower, the FCC staff member said.

Bureau 'Misguided'

In one typical letter from an AT&T stockholder in Arizona, the "Common Carrier Division" was referred to as "misguided" and the writer said it was his opinion that "it has been staffed with key personnel with a bias against the Bell System.

"The Division would very much like a situation where it would be able to play one outfit off against another. The results of such gamesmanship are only too apparent in the results of regulatory agencies.

"I therefore urge you to support [the legislation] and to permit this country to continue to enjoy the world's finest communications system," the writer said.

Another letter from Florida, also from an AT&T stockholder, said it "is time for Congress to look closely at the direction in which the FCC is trying to take an effective communications system."

Correction

The former U.S. Deputy Attorney General who said the Justice Department was making a potentially serious mistake in using agents from the Federal Bureau of Investigation to interview IBM's trial witnesses was Warren Christopher [CW, May 17].

Christopher, who served as Deputy Attorney General from 1967 to early 1969, is now with the Los Angeles law firm of Omelveny & Myers, which is part of IBM's legal defense team in the government's antitrust suit against the corporation.

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Cost for the entire seminar, including continental breakfasts, luncheons, dinner, and all course materials is $325 per registrant, and $300 for each additional registrant from the same company. An additional $50 bonus discount will apply to each registration received by June 7, 1976.

Chicago	**Drake Hotel**	**June 17-18**

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

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San Diego	**Plaza International**	**Sept. 27-28**
Denver	**Denver Hilton**	**Oct. 18-19**
Miami	**Holiday Inn Airport Lakes**	**Nov. 15-16**

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

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Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Chicago	**Hyatt Regency O'Hare**	**June 16-18**
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How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Atlanta	**Hyatt Regency Atlanta**	**May 3-4**
St. Louis	**Marriott at Lambert**	**May 24-25**

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

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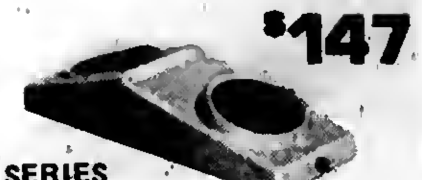

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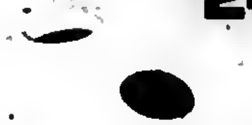

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System Sifts Ariz. Garbage Can Data

By Catherine Arnst
Of the CW Staff

TUCSON, Ariz. – Every time someone here throws something out, he is faced with the knowledge it might be analyzed with a computer at the University of Arizona.

That's what is being done by the Garbage Project, a three-year-old program dedicated to finding out what Americans throw out. And, according to the project's findings, Americans throw out about 10% of the food they bring home.

The Garbage Project comes under the auspices of the Department of Anthropology and works under the theory that by looking at trash one can better understand human behavior, according to Wilson Hughes, assistant director of the project.

Students collect the trash with the cooperation of the municipal Sanitation Department and they catalog each item of an individual household's garbage. Approximately 10 houses per day are analyzed, and they are selected at random from within census tracts that indicate demographic and housing characteristics.

The students fill out computer-formatted forms in which they note the census tract number, volume of the garbage, number of items, the category each item comes under, the brand name, packaging and whether it is straight waste (thrown out before serving) or table scaps.

The data is punched onto computer cards, run through a Control Data Corp. CDC 6400 and analyzed by a Fortran program written within the department.

Garbage on File

Approximately 100,000 pieces of garbage have been analyzed and are on file so far. In 1973, 222 households were studied, 388 in 1974 and 208 in 1975.

With the results generated by the computer, students compare the discard and consumption habits of different parts of the city. They have discovered that middle-income groups waste more than low income groups. "There is 20% to 40% less waste below the poverty level," Hughes said.

It was also found that lower income groups eat less protein than others, but that they have better balanced diets, whereas middle-income groups eat more junk food, Hughes said.

When looking at the garbage thrown out as a whole, 60% of the total waste is straight waste, and the items thrown out the most are fresh fruit and vegetables and bread, Hughes said.

The amount of table waste has decreased in the three years the project has been in effect, which has lead one nutritionist working with the project to assume that families were coping with high food prices by decreasing serving size but not altering buying habits that much.

When the project started in 1973, during the meat shortage, it found "quite a bit of food waste," but there was less waste when prices went down during 1974, Hughes said.

He attributed this to people buying cuts of meat they were not used to or buying more than they could store.

Beer Boom

An off-beat discovery was made by one student, in his own analysis of the data gathered by the Garbage Project. He found that more beer is consumed when there is a full moon.

The idea for the Garbage Project originated from an assignment given to anthropology undergraduates to look at the modern world and find a relation between material culture and behavior. One student chose to do this by looking at garbage, "which is part of our material culture," Hughes said.

The project is funded by the University of Arizona, the National Science Foundation and some private industries such as Chevron Oil, Alcoa and General Mills. The Environmental Protection Agency also might grant funds to do a study of packaging, Hughes said.

One of the original purposes of the project was to communicate the information garnered from the studies to the public, so that they would become aware of their habits.

"The feedback has been very positive," Hughes said. No garbage is identified by name or address, and no personal mail is recorded, so the anonymity of the waster is protected, he said.

Hughes could not say, however, whether the project has made a difference in the waste habits of the citizens of Tucson.

DP Seen Helping End Restrictions Of Interdisciplinary Approach

DARTMOUTH, N.H. – The computer is a possible key to help free scientific thought from the restrictive confines of the various academic disciplines, according to a networking authority for the National Science Foundation (NSF).

"We live in a world that is more and more knowledge-dependent or rather technological knowledge-dependent," Dr. Walter Sedelow, director of science networking for the Division of Mathematical and Computer Sciences of NSF said at the annual meeting of the New England Regional Computing Program (Nercomp) at Dartmouth College here recently.

"In this context, a serious problem exists in getting scientists to work across disciplinary lines. They'll work together to get money, but it's much harder to get them to collaborate together in substantive research and educational enterprises, Sedelow said.

"In educational institutions, we've not yet come to terms with the need for a massive adjustment in an interdisciplinary approach to problems in a full-systems way, in the best tradition of the liberal arts."

Acknowledging that he was less than optimistic about the ability of man to solve the mounting problems of contemporary society, Sedelow said in his view only two major regions of the country are in a position to mobilize the scientific resources of the area to deal with immediate problems.

These regions are Southern California and New England, he said.

"We need a distributive laboratory as both a research instrument and a pedagogical device," Sedelow maintained, "and also as a means to achieve a sense of social cohesion through intellectual enterprise."

He saw the computer network as a way of bridging gaps between faculties of various institutions, the isolated and lesser known as well as the renowned universities, and "mobilizing their technology to enable people to work together who have something to say and something to do, no matter where they may be."

To begin to achieve such ends, computing networks have to be geared to providing scientists what they need, not what programmers think they need, he cautioned.

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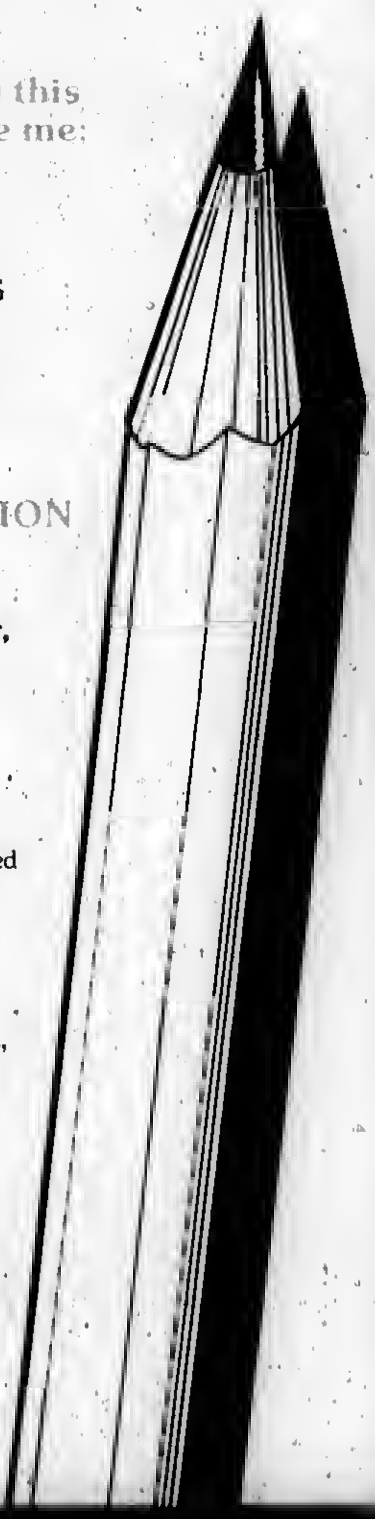

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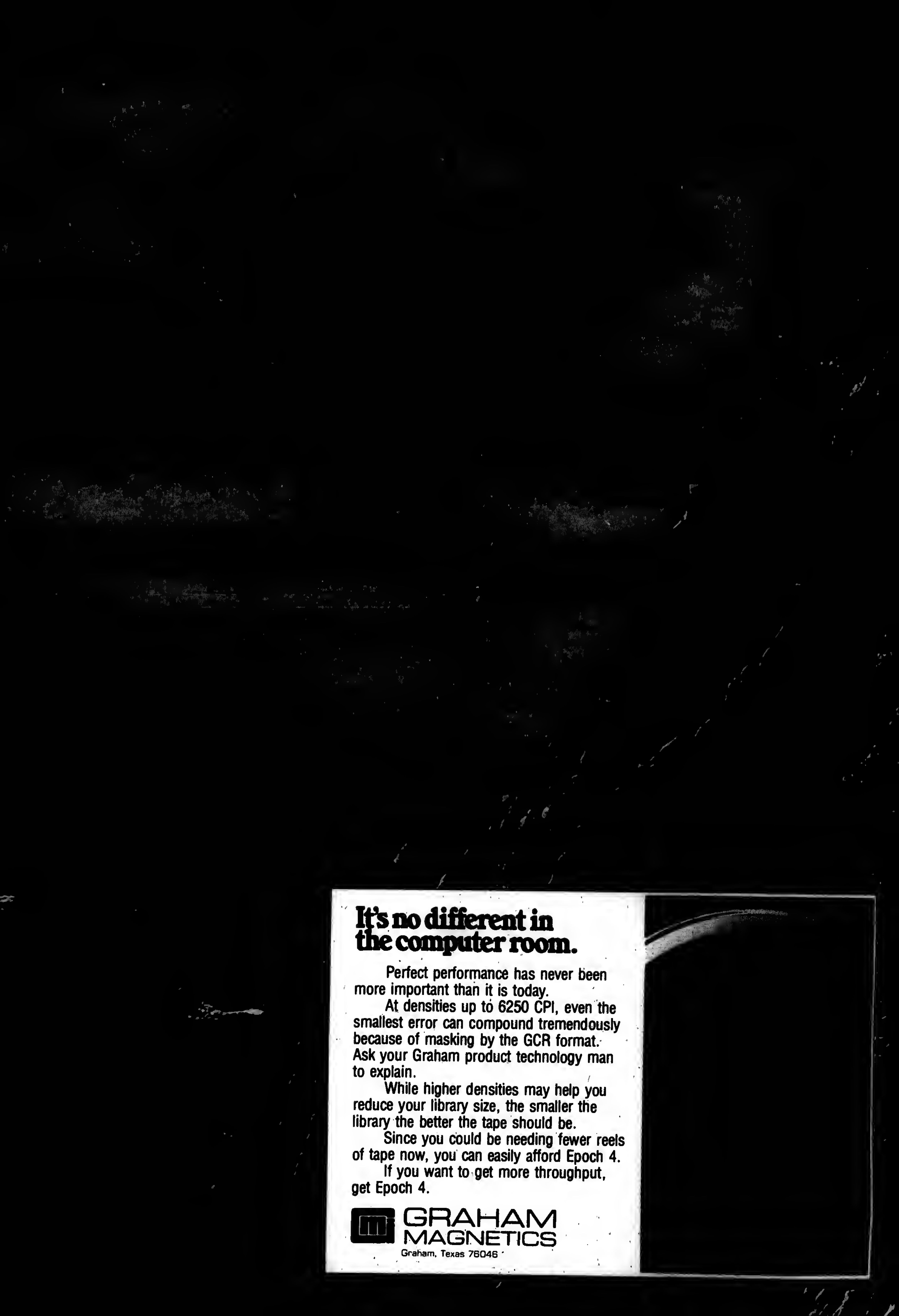

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Editorial

Learning the Hard Way

The findings of the recent investigation into the jail suicide of young Steven Karagianis in Yonkers, N.Y. [CW, May 17] proved once again that computers are only as good as the people who interface with them.

According to the young man's mother, Karagianis killed himself rather than spend even one night in jail. She said he had been in jail once before and the experience was so horrifying that he didn't ever want to end up there again.

Whether Karagianis overreacted to his incarceration is not for us to judge. However, it is appropriate for us to expose the kind of mismanagement that would lead to jailing a person on the say-so of a communications operator with 16 hours of training in police communications.

It is also appropriate for us to question why a law enforcement agency doesn't assure that warrants are outstanding before police officers are sent out to arrest citizens.

It is inexcusable for a communications operator who is responsible for receiving coded messages and for translating those messages to police officers in cruisers to be fuzzy on the meanings of those standardized codes.

Police officers use the information relayed to them by communications operators to make life and death decisions every day.

Nowhere was that more apparent than in the roadside death of Frank D. Booth who was shot by a Florida state trooper in the belief that Booth was driving a stolen vehicle and that he might be dangerous [CW, Dec. 10].

In the Florida case that information was received from a communications operator who corrected the erroneous transmission within seconds, but a correction even seconds later was too late. By then, Booth was already dead.

The computer has become the lifeblood of 20th-century law enforcement in America. There is no excuse for underestimating the importance of the individual who accesses the data it contains.

Furthermore, it is about time the Federal Bureau of Investigation and its National Crime Information Center (NCIC) acknowledged that even police officers are only human — that they can make mistakes.

The Karagianis case proved that too much information can be as dangerous as too little information. It was clearly unnecessary to maintain a wanted record on an individual who is no longer wanted by any police jurisdiction simply for the convenience of the NCIC bookkeeping procedures.

It is sad, indeed, that an innocent citizen has to die before bureaucrats will give faulty procedures enough attention to bring about a change.

'Sorry, Mr. Dinwiddy, I Can't Afford to Print a 346th Copy Just For You. . .'

Letters to the Editor

ICCP Asks Help in Developing Exam to Test Business Programmers

We of the data processing profession have cried for years for a tool by which we could measure the technical abilities of computer programming and software people. The Data Processing Management Association (DPMA) started in this direction through the Registered Business Programmer (RBP) exam.

As many know, DPMA turned all of its testing programs over to the Institute for Certification of Computer Professionals (ICCP). ICCP, through its eight member organizations, has completely revitalized the Certificate in Data Processing (CDP) exam. It will now be doing the same with the RBP exam.

To accomplish a task of this magnitude will not be easy.

For this reason, the ICCP is asking for the submission of multiple-choice questions for consideration of inclusion in a question pool for this new exam.

ICCP asks that these not be nit-picking questions about a particular operating system, but questions testing the knowledge of a top programmer.

Please submit all questions to:

Computer Programming Exam Questions
ICCP
Attn: Dr. Sallyann Henry
304 E. 45th St.
New York, N.Y. 10017

Robert L. Huskins

Frankenmuth, Mich.

Definition Neglects Due Process

John Kannarr's letter [CW, May 10] defined two classes of personal data: data given freely by the individual for a specific purpose and data not given but "earned" by a company — i.e., when an individual defaults on a loan (Kannarr's example).

He maintained that "earned" data should be salable at the discretion of the company "earning" it.

This position neglected a fundamental concept of our society: due process. In effect, Kannarr said a bank should be allowed to "convict" a person of financial irresponsibility without benefit of trial.

When due process really works, everyone is protected, not just the strongest or the loudest.

Alan Schlutsmeyer

Pasadena, Calif.

Scare Techniques Used

It disturbed me to see misinformed people using scare techniques to prevent privacy legislation. No one is against data gathering for research, as William A. Fenwick seemed to imply in the May 3 *Computerworld*.

It is quite feasible to do the most elaborate studies and still protect the individual's right to privacy.

Particularly now with the disclosures of the abuses of the U.S. intelligence community, lawyers in particular should be concerned about dossier collecting which does require a name and a universal identifier.

B.F. Medina

Mansfield, Pa.

(Other letters on Page 12.)

Data Past

Eight Years Ago
May 22, 1968

WASHINGTON, D.C. — Dr. Carl Hammer, director of scientific and computer services for the Univac Federal Systems Division here, advocated the use of a computerized ballot casting system for local, state and federal government elections. He said the technology was available; such a system would increase the number of people voting; fraud could be eliminated; and the cost would not be prohibitive.

— — —

WASHINGTON, D.C. — Eleven independent software firms, with sales of more than $100 million annually, formed the Association of Independent Software Companies (AISC). The purpose of the trade association was to handle common problems in the industry.

Five Years Ago
May 26, 1971

ATLANTIC CITY, N.J. — The general public is more worried by "what it suspects but does not know" about the impact of computers, Sir John Wall said at the Spring Joint Computer Conference (SJCC) here. A result of this public attitude would be the federal imposition of regulations on the industry if the industry did not "police itself," he said.

— — —

ATLANTIC CITY, N.J. — In a "Competitive Evaluation of Interactive Systems" by the Ford Motor Co. here at the Spring Joint Computer Conference (SJCC), Burroughs Corp. took top honors in the benchmark comparisons of large time-sharing systems for ease of use, computing power, reliability and support software. RCA fared the worst in the comparisons; the other companies' mainframes, in descending order, were Control Data Corp., Digital Equipment Corp., Xerox Data Systems, Honeywell, Univac and IBM.

Anti-Obsolescence

The toughest task in our trade is to keep up; to learn the new techniques, or the new buzzwords for the old techniques; to take a quick look at new hardware. And of course whole vistas open up every few years: data communications, which is a world in itself, with weird acronyms, and protocols as well as programs; security technology, hard and soft; the mini/micro revolution.

And the Red Queen was right: "... it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!" For advancement, that is, you must *add* skills, not just update your old ones. You're in data processing? Take a calculus course! You're in computing? Take accounting! You're a back-room type? Take a management course, and maybe one in abnormal psychology! You're a high-level manager? You're a high-level manager? How about learning The Hustle at Arthur Murray's?

OK, you did it: you attended a long seminar, took a night course, read an appropriate text. You mastered Ambition, Distraction, Uglification and Derision, as the Mock Turtle recommended. Now, how about the diploma, the medal, the graduation ceremony (and secretly, of course, how about the raise)? Well, in some cases a diploma *is* provided. But for many intellectual exercise sessions, especially the self-improvement kinds, something else is needed – something more general, something easily recognized.

Here the professional societies can help. The DPMA recently handed over to the new Institute for Certification of Computer P(rofessionals, eople, rogrammers) the CDP examination. Pass the test: be Certified! But at least two things were lacking. First, there are many areas less frequented than mainline data processing, and higher levels than basic even along the Main Line. Second, the acts of test-taking and especially of test-failing are not pleasant ones. For those long out of the examination mode, for those exposed in some way, for the poor, the proud, the perverse, testing and certification are painful.

A new concept has just been publicly unveiled: self-assessment. A special ACM committee–has pulled back the curtain, in the May *Communications*. I quote a key sentence: "... [the procedure] is not for an individual to satisfy others about his or her knowledge; rather it is for a participant to appraise and develop [that] knowledge." A sample, fragment of one of the assessment procedures, is given, along with "suggested" responses and specific references to books or papers for each question. It looks great, but that really isn't the crux of the matter. The central issue is the novelty, the fresh technique.

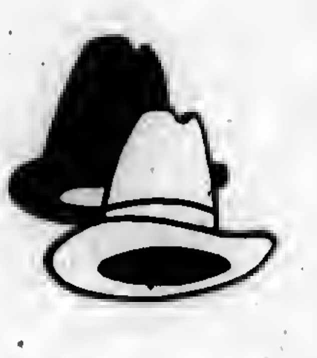
Does it threaten the CDP? Surely not, either as certification now stands, or after hoped-for improvement. In fact, I assume many self-assessed persons will feel encouraged, and will move toward the more formal process. Does it threaten the current apparatus of seminars and short courses and book-learning? No, except in directing participants more accurately toward subject areas for which they see a clearer need.

Are the procedures too narrow, too specific? Well, we'll need much larger samples, and more experience, to tell – but all tests, self-administered or otherwise, have to be sampling procedures, whether the ACM attempt, the CDP exam, or a Ph.D. oral. There is a real art involved; if the self-assessment idea flourishes, expertise will be available.

Does it have to be ACM? Not in the long run, certainly; in fact, ACM people assume the same concepts must be at work in entirely different fields already, notably in medicine. But they should get credit, both the committee and the Council, for an early entry and a vigorous thrust. I would be unhappy, for instance, to see the IEEE Computer Society do the same thing in software and applications areas ("software engineering"), while welcoming their adoption of the idea in non-ACM precincts: componentry, peripherals, systems architecture, test hardware. Also the possibility of a broader approach via ICCP or AFIPS is already in many minds, and will certainly be explored.

Obsolescence is costly; no one knows how costly, but whole countries can wither from it: the British industrially, the Italians socially – and perhaps the Americans? In our trade, where half or more of the tools we use and the knowledge we apply are less than a generation – six yeras – old, drastic measures were needed. I believe the ACM initiative is the most imaginative such measure yet suggested, and urge every reader to look the self-assessment samples over carefully. We all are subject to the Paul (Armer) Principle: individuals often become incompetent over time at a level at which they once performed well.

Those still fresh and green will shrivel; older inhabitants will become extinct; antediluvians like me ... The Aeneid says it: "Facilis descensus Averni ... but to climb back again, to retrace one's steps to the upper air – there's the task."

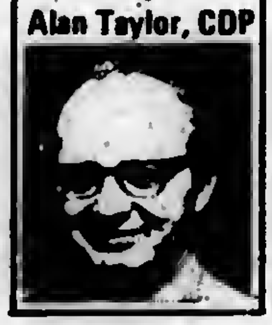


Herb Grosch

Solves Mail Duplication Problem

Rosa Index File Helps Avoid Merge/Purge Overkill

The Taylor Report
By
Alan Taylor, CDP



One of the advantages of studying a specific computer-use area, like mail-duplication problems, for instance, is that it brings out the wide variety of management actions that are available to assist in the quality control of data processing systems in general.

Such a management action, which I think has wide implications although currently considered just in the mail-duplication area, has been suggested by a reader, Paul R. Rosa, of St. Paul, Minn.

Rosa is a systems programmer who has been watching the mail duplication problem with concern. He agrees that some better method of eliminating duplicates is desirable and hopes that such a method can be developed soon so that what he calls "the negative image (of data processing) that duplicate mailings cause" can in turn be eliminated.

However, he is not satisfied with the current methods of eliminating duplicate mailings. This is not because they don't work – he acknowledges that they do. The problem with them, as Rosa sees it, is that they may work too well. Rosa sees them eliminating nonduplicated addresses as well as genuine duplicates. He is worried about "overkill," and quite rightly so.

The background for his concern comes from the trucking business. He pointed out that he has seen as many as three company names, all similar in spelling and all using the same mailing address. All the elimination algorithms he has seen would remove two of these companies, although they are actually valid ones.

Problem of Facts

His problem is one of facts. There is nothing theoretical about it. An address is either right or wrong. The proper way to answer such a question is to go to the address concerned physically and look for both people. Naturally, this is not done. It is too expensive in almost every case. All the merge/purge programs that try to eliminate duplications are simply attempting to "guesstimate" what would happen if someone actually made an on-site visit. No more and no less.

Realizing this limitation of mailing duplication programs, Rosa took a different approach. He argued that an address, if it is real, will be reflected in ways other than by comparing strings of characters or even eyeballing. Mistaken addresses also, in time, build up activity patterns which can assist in making determinations of error/nonerror.

The key words here are those two little ones – "in time." Rosa has added to our repertory of weapons the always emerging history and calls on data processors to take into account the fact that history is available to us. The decision to ignore it, taken either consciously or unconsciously, is something that is our responsibility and not something that is forced upon us by the state of the art.

Rosa saw the method of taking historical facts into account as involving an "index" or "alias" file. Any item that is not an exact duplicate of an existing entry is noted during update operations and then is added to the index file.

Where, on periodic review, it turns out that an entry is either misspelled or is accurate although different, a pointer is set up in the file, and one or the other address is selected for use.

The duplicate entry in the main file can then be eliminated, after having been there for only a short space of time. However, it remains in the index file to help to clarify any later confusions.

This is a good method. Rosa pointed out that the output needing manual review quickly drops off to minimal levels after the system has been in operation a relatively short period of time. Cost of operation, as opposed to initial setup, is therefore controllable.

It is the setting up of the system which does involve a considerable one-time cost that makes the system often appear too expensive to use for mailing lists. But I really have not seen any good analysis that shows just what the costs really are – so I can't agree with such a conclusion.

Possible Developments

Moreover, I think the system has other possibilities Rosa has not brought out. While he is showing that duplicates can be eliminated, the system also provides for nonduplicates to be positively identified. Then presumably, a nonpointer, or difference statement, could be put into position.

For instance, If XYZ, Inc. and XYZ Corp. both happen to coexist on Happy Lane, Your State, and this is once found out, then a nonpointer could join the two addresses, working in both ways.

Such a nonpointer could bring out what the distinction between the two near-identities was. Later, when a potential duplication had to be resolved, this distinction, held in the index file, would be able to resolve the problem correctly – without eliminating valid entries, which was Rosa's worry.

This suggests that the pointers and nonpointers go further and store with them identification of areas of confusion that are, or are not, material. If this confusion identifier is added to the Rosa system, it appears to add the necessary safeguards of validity which in turn permit a more rigorous weeding out of actual duplicates.

All this is possible and provides computer systems with the ability to improve with age. No one, and certainly not John Q. Public, expects everything to be right first time. But the public does expect computerized systems to not keep blindly following error paths.

The Rosa index file appears to provide a method whereby such repeated errors can be avoided. It is a new and different concept which appears to provide a workable alternative to merge/purge problems; particularly to operations that repeatedly provide mailing or other similar services.

With the current constant reduction in the cost of processing power, the cost of such improved service is not clearly out of a user's reach this year – and will be still less in the years to come. I commend it to you as a method of improving quality in your area.

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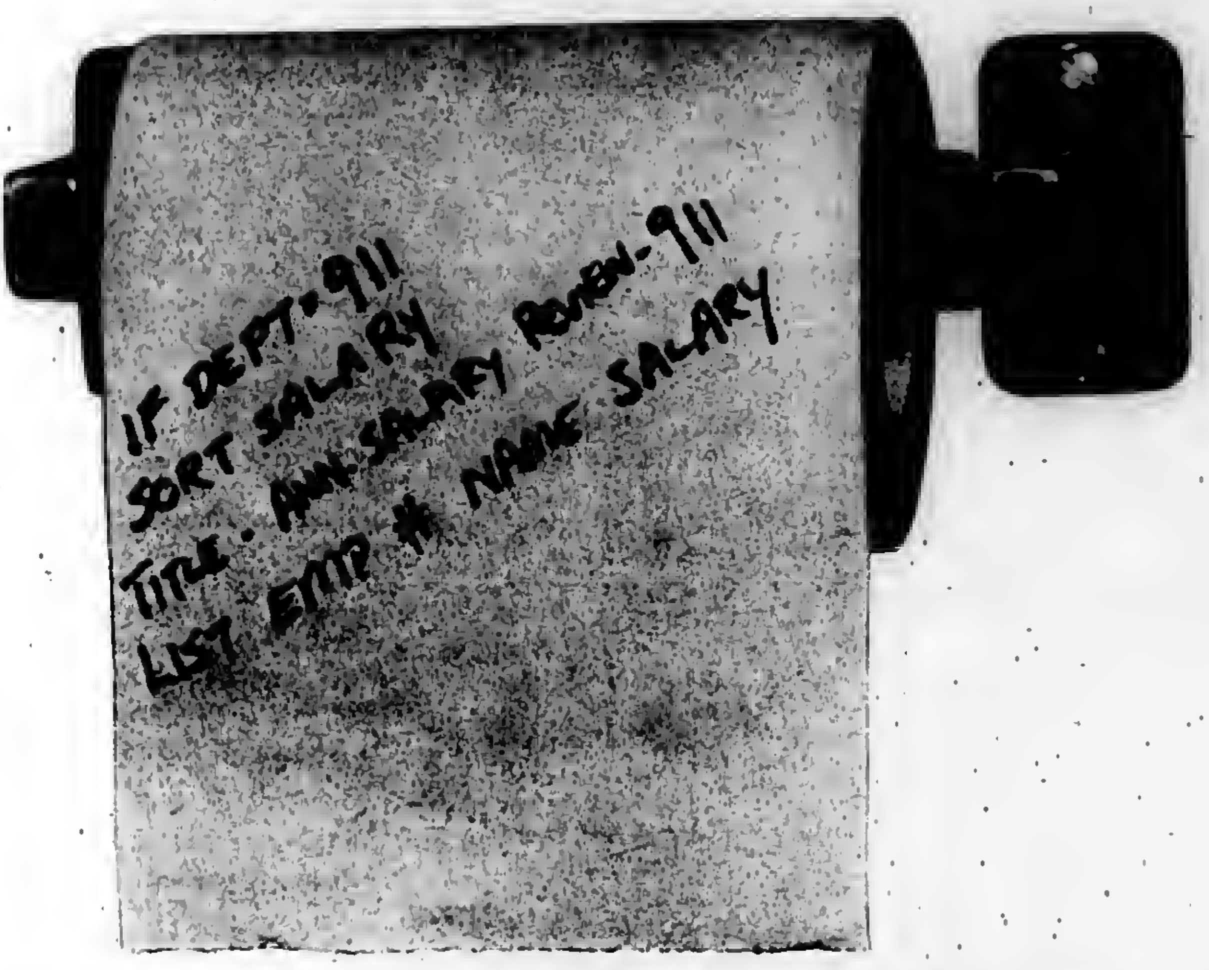

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Letters to the Editor

Speech Intent to Describe Possible Future Problems

There were some inaccuracies in the article, "Laws Often a Factor in Net Decisions" [CW, May 3].

First, as I mentioned in my speech, the reports that were printed in Vancouver were not reports that came from the Nordstrom Corp., but were reports of another company for which I had worked previously.

This situation would also affect Nordstrom or any other corporation which intends to take computer listings and tapes across the border into Canada. Nordstrom does not operate in Canada.

Second, the Canadians are not necessarily "threatening." That is an inappropriate word; they have published a study which suggests that data should be taxed and that data on Canadian citizens should be retained in Canada rather than allowed to cross the border. There has been no threat, as yet, of carrying out the study's suggestions.

Third, the area of chargeback has not caused Nordstrom accounting problems.

Fourth, the network we have consists of NCR 725 minicomputers in Anchorage and Seattle, Washington. There is no mini in Tacoma, and San Francisco is only the network point for satellite communication service to Alaska.

Fifth, the intent of the speech was not that Nordstrom has these particular problems today, but that Nordstrom, or any other company, may face these problems in the future.

Landon Miller
Seattle, Wash.

Change for Sake of Change

The National Association of Wholesalers (NAW) is trying to establish a single uniform numbering system for all items which travel through all distribution channels.

NAW is taking the National Association of Electrical Distributors (NAED) four-position manufacturers vendor number and adding a two-position prefix which will now make an 11-position number.

The prefix was to represent a particular industry, but I have been told this idea has been abandoned. The prefix addition is still going through, but now it is being assigned in a completely nonsignificant manner.

There seems to be a great deal lacking on NAW's and NAED's part in explaining just what their objectives are and what they eventually are trying to accomplish.

We live in a constant state of change, but to be forced to change without knowing why and how it might better my company is utterly ridiculous.

Michael P. Eiseman
Chicago, Ill.

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In Joint Datapro-Atsu Study

Time-Sharing Services Get 'Well Done' From Users

By Don Leavitt
Of the CW Staff

DELRAN, N.J. – Users of remote-computing services are "generally well pleased" with what they're getting when measured by one set of criteria. But there is "plenty of room for improvement" elsewhere, according to a recent user survey.

Users responded very positively in terms of overall satisfaction, ease of use for experienced or DP-oriented users, languages and compilers provided, reliability and response time, the survey found.

On the other hand, cost-effectiveness, technical support, training, documentation, application packages and ease of use for inexperienced users all polled lower scores, according to the results.

In the survey, run jointly by the Association on Time-Sharing Users, Inc. (Atsu) and Datapro Research Corp., users were asked to rate any and all remote-computing vendors with whom they did business in 13 categories on a scale of 1 to 4, with 1 representing "poor" and 4 "excellent."

The survey was based on a questionnaire, primarily designed by Atsu, which was mailed to 2,500 association members or interested people and 500 or 600 Datapro subscribers earlier this year.

Qualified responses were received from 475 users of remote-computing services in the U.S. and Canada. Both Datapro and Atsu appeared pleased with the number of responses, but Datapro noted its subscribers and Atsu's members "may not constitute a completely representative sample of 'typical' users."

Despite the vast number of vendors in the service area surveyed, nearly one-fifth of all responses (134 out of 726) were addressed to General Electric's offerings, which earned a 3.0 weighted average of all ratings applied to it in all 13 categories.

The Service Bureau Co. ran second in number of responses with 80, but garnered a slightly higher weighted average of 3.07. Tymshare, Inc. was third in number of responses (46) and came up with a 2.96 weighted average.

Fourth highest in responses (40), Computer Sciences Co. collected a weighted average score of 3.02 while fifth-place National CSS, Inc. (with 36 users) eased off to a 2.92 weighted average score.

Five other vendors – Cyphernetics, Compu-Serv Network, United Computing Services, Comshare and Control Data Corp. – also tallied more than 20 responses each. Together with the first five, they accounted for 458 or nearly two-thirds of the 728 responses received.

Comparisons Challenged

Although Datapro listed the detail "votes" for all vendors who received five or more responses, the validity of the smaller groups and the value of comparing them to the more popular vendors has been challenged by some observers.

With only five ratings being averaged, even one that is unjustifiably high or low can warp the outcome far more than would be possible in the larger samples, these analysts explained.

Highest weighted average rating of all was earned by Interactive Science Corp. with a 3.38 based on five ratings.

Many users commented on experiences with two or more vendors and the average number of companies mentioned was 1.56.

This reflected a slight downward trend from last year's reported average of 1.74 vendors per response, but a Datapro analyst shrugged off the difference as "insignificant," especially since the current survey evoked four times as many responses as the last one.

Fortran Most Popular

Taken overall, the user's responses also showed that interactive time-sharing or problem-solving is still the predominant use of the network facilities, in terms of numbers of jobs although not necessarily cost, and that Fortran is still the most popular language.

The 41-page "All About Time-Sharing and Remote-Computing Services" report on the survey results also includes discussions of how a user should choose a remote-computing vendor and comparison charts of what a number of the networks offer, as well as addresses of their national headquarters.

The report costs $10 and is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

NCR Unbundles Software Prices With Costs of $5- to $150/Mo

DAYTON, Ohio – NCR has adopted a policy of pricing selected, newly acquired software separately from the hardware on which it is to be installed. Previously most NCR software was included in the price of the equipment.

The policy affects both rented and purchased computer systems, the company said, but there will be no change in pricing for Century users of software installed or on order prior to May 1, a spokesman said.

Current Century users who move to other Century systems can continue to use their installed software on the new CPU without any change in cost. Century users migrating to Criterion mainframes [CW, May 3] may carry Century software forward at no cost, provided the programs were in use or on order before May 1, the company stated.

The currently supported system control programs or operating systems are apparently excluded from the unbundling policy. This follows the pattern set by IBM, recognizing such software as fundamental to the operation of the equipment and therefore inseparable from the cost of the computer itself.

Application Package Fees

For application packages covered by the policy, there will be an initial fee plus a monthly fee. Initial fees range from $250 for "most programs" to more than $3,000 for a "totally integrated system of financial application modules," NCR said.

The initial fee provides use of the covered software for a year without additional fees. After that, fees range from $5/mo to $135/mo, the spokesman added.

System software is subject to monthly fees only, ranging from $5, covering a library of unsupported routines such as the 8B Executive, to $150 for a full-blown time-sharing system.

Indexed Sequential Access support (at $15/mo), Remote Batch Entry ($20), RPG ($40), and "full" Fortran ($75) fall in between those extremes. So does a combination of Neat/3 Assembler and Cobol '68 compiler which cost $90/mo under the plan.

'Superlib' Gains Audit Trail

JACKSONVILLE, Fla. – Generic Systems, Inc. (GSI) has the Superlib library management package and added a pair of routines that can be used with the package (or by themselves) in IBM-based installations.

Superlib Version 3.2 includes support for an update audit trail, flexible text editing, extended library management reports and closer ties to IBM's Power/VS spooling facility.

One of the freestanding but complementary routines creates cross-reference lists of the sources of all COPY and CALL statements and the library members or subprograms that have been the subject of such commands.

The other "independent" routine supports updating of the core image and relocatable libraries. It supports modification of either library from any partition, including simultaneous updating of the same library from both foreground and background at the same time, GSI said.

The update audit trail enhancement "version-marks" each line of a program with date, time and version number so that when a change is made it is documented. The text-editing feature allows scanning and replacement of character strings, limited if the user wishes to specific lines or to particular columns within the coding structure.

Management reports show library content and activity by system, programmer and language type. The Power/VS linkage allows the user to feed compilation streams directly to Power without creation of SYSIN files, with "considerable" throughput improvement, according to the vendor.

Purchase price for Superlib is $3,000 (DOS or DOS/VS) or $3,500 (OS). The Cobol Cross-Reference reports routine is available separately for $500. The "Easy Object" updating routine costs $850, GSI added from 4251 University Blvd., South, Jacksonville, Fla. 32216.

Financial Modeling Focus of Atsu List

NEW YORK – A loose-leaf listing of financial modeling languages is being distributed to members of the Association of Time-Sharing Users, Inc. (Atsu) as the first portion of what is expected to be a comprehensive directory of the time-sharing and remote-computing industries.

The association needed a directory "that would [show] us the options available, with enough information about each product to enable us to narrow down our choices before we start detailed analysis," a spokesman explained.

More Than 60 Entries

The current publication includes more than 60 entries. Formatted descriptions of each, provided by its vendor or developer, features as well as where the facilities are available.

A foreword provides an overview of the different types of modeling languages now on the market.

Information about the association and its publications is available from Atsu, 210 Fifth Ave., New York, N.Y. 10010.

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Ask What Package Won't Do Before Buying, Mini Users Told

SAN FRANCISCO – A user buying a minicomputer application package "should really look into the code" to find out what the package will not do, Steven E. Richfield, an independent consultant, told a Computer Caravan workshop here recently.

The user should ask whether buying a software package is really justified, Richfield said. If "even a relatively small improvement in the amount of time it takes to get things going" in the business represents a cost savings to the user, the purchase is usually justified, he explained.

"Watch out for software from hardware manufacturers," Richfield cautioned. The slower the package runs, the more hardware the user will need to run it, he said.

"When you are dealing in business, you really should deal with someone who has an interest in making it work," he added.

Users usually give insufficient thought in defining what tasks they want the software to accomplish, he said. "Sit down and really dig in before you ever put your name on the line," he advised.

Users should also avoid one-person package evaluations, he warned. They fail because a single person selecting a package doesn't ask "How can this be done a whole lot more simply and still run the business?"

Another problem in selecting packages is that the business manager may underestimate the paper flow, Richfield said.

Places to Start Looking

To find a package, users can contact places that list packages such as Auerbach Publishers, International Computer Programs (ICP), Datapro Research Corp., the National Technical Information Service, users groups such as Decus and Share and the classified ad section of technical journals, Richfield said.

A user who has to revise more than 15% to 20% of a package is better off writing the application himself if he knows how to proceed, Richfield said.

The actual implementation of a software package is simpler than building up to this stage, he continued.

The user must look at the hardware and make sure the package will not put too much of a load on his machine, he added.

"If you need additional hardware, will you get it in time?" and is the effort "really a bargain in respect to the dollars for hardware?" he asked.

Dealing with a package vendor could be a sticky situation, Richfield said. The user needs to include in the contract a liquidated damages clause to prevent the vendor from leaving a project in the middle, he said.

"Penalties are a good idea, but don't overdo them. A big penalty could cause a vendor to walk," he warned.

Options Are Open

"You should really understand the written law as regards collection. If you do get into a horror story, there are options available to you," Richfield said.

However, the losses the user sustains must be very large in order to justify the dollar costs of court action, he noted.

Documentation is another important factor in buying a software package, he said: "If you are buying for a mini and it has to be custom-tailored, spell out what documentation is necessary."

Users should remember when they get a package that they are "looking at two conversions – the conversion to the package now and the conversion from the package five years from now."

The package chosen may not be easily interfaced to a future system should jobs and hardware change, Richfield said.

IUP Supports Insurance Claims Entry, Checkout

WHITE PLAINS, N.Y. – Insurance claim entry and coverage verification can be handled on an IBM 3270 CRT terminal linked to an IBM 370 by using the master policy file maintained by the Property and Liability Claims Entry Installed User Program (IUP) now available from IBM, the vendor said.

Distributed on an "as-is" basis, the program includes entry editing, support for inquiries about the status of policies and individual claims and management-level claims analysis and production statistics.

Designed to run under DOS and CICS, the IUP requires 100K.

Cataloged as 5796-AGK, the program carries a license fee of $500/mo which is waived after the first 12 months.

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'Valu-Gen' Uses VCI Report Data

CHERRY HILL, N.J. – Valu-Gen from Value Computing, Inc. (VCI) is a report writer to help users of the vendor's job-accounting, billing, scheduling or tape library systems create installation-specific output not normally a part of the primary systems, VCI said.

Although input for Valu-Gen is limited to the report files already being produced by the other VCI products, sorting, accumulation and arithmetic functions typical of conventional report writers are "certainly" built in Valu-Gen, a spokesman said.

Output may take virtually any form the user requires, including graphic and matrix as well as tabular forms, he added.

Once coded, output routines may be stored for later retrieval and use by user-designated name, the company said.

This ability has also led to another part of the Valu-Gen package: support for a library of specialized reports which may be of value to particular users – those in common industry groups, for example – even though not universal enough to be built into the standard VCI packages.

This library will be made up of routines written and contributed by users and distributed by VCI as part of the package, the spokesman added.

Valu-Gen will be made available first to IBM-oriented users.

The OS-OS/VS implementation of Valu-Gen is available now for $1,500. The DOS-DOS/VS version, expected within three months, will cost $500, the spokesman said from 300 VCI Building, West Marlton Pike, Cherry Hill, N.J. 08002.

IEEE Seeking Papers On Data Base Design

URBANA, Ill. – The IEEE Computer Society is seeking papers on operating and data base system design for a limited-attendance workshop it will sponsor at Northwestern University in Evanston, Ill. Nov. 4-6.

The workshop should include some vendor representation as well as data base system users; this mixture is necessary to have all viewpoints presented, according to program chairman E.J. McCauley III.

Topics to be covered will include requirements of data base systems for protection, reliability and recovery, their relationship to operating system design; performance questions; the use of virtual memory; and front-end and back-end system designs for the data base management functions.

Four copies of full-length papers and short summaries should be submitted by Aug. 9, to McCauley at the Center for Advanced Computation, University of Illinois, Urbana, Ill. 61801.

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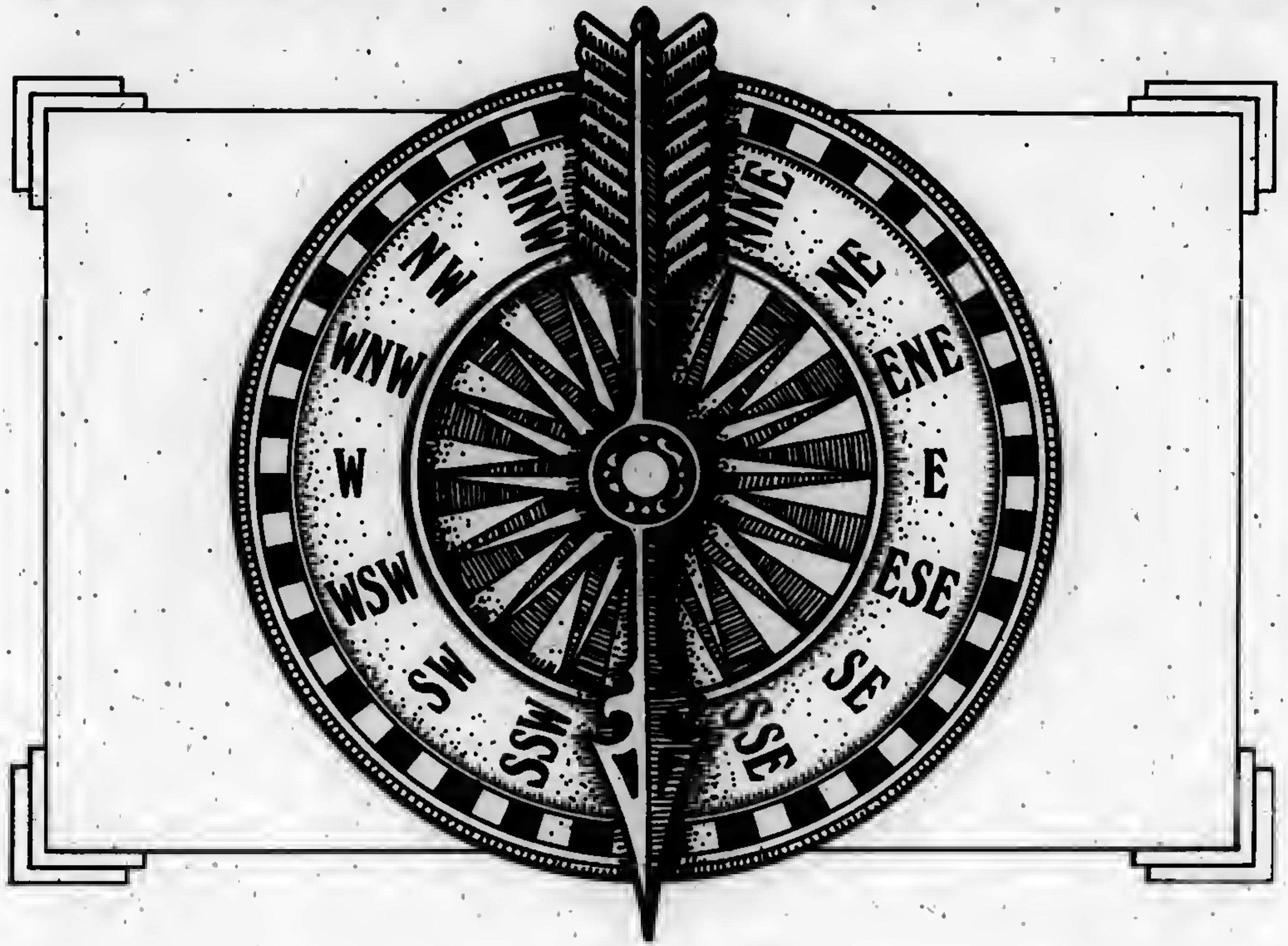

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Cobol Compiler Aids Nova Sites

EVANSVILLE, Ind. – The Cobol compiler now available from Universal Computing Systems, Inc. for Data General Nova/RDOS environments is based largely on 1968 ANS Cobol specifications, but includes two Cobol '74 modules "and various extensions," according to the vendor.

In addition to the compiler, the Universal package contains a set of file-handling utility programs including a five-key sort program and a report generator, both of which can be used in stand-alone mode, a spokesman said.

The Cobol '74 modules built into the current version of the compiler are Sequential I/O and Indexed I/O.

While the compiler appears to support many features not necessarily part of Cobol – on-line data entry and on-line inquiry, for example – the language processor requires two passes to reduce Cobol source code to object code; the "compiler" merely reduces Cobol to Assembler code.

But it does support random, sequential and keyed disk-based files; the keyed files may be indexed to any level, according to Universal.

Three levels of subscripting can be handled and conditional statements may be nested to 10 levels, the spokesman added.

In common with Cobol compilers for large-scale CPUs, Universal's allows 30-character data names and backs automatic decimal point alignment and sign control.

Identical data names may be made unique through qualification, the company noted.

Any standard RDOS-supported configuration is acceptable to this Cobol package. A minimum configuration would consist of a 16K Nova, a 512K-word disk and a console.

Extra memory "will be used to advantage" for symbol and entry point tables, Universal said.

The package, which includes object code for the compiler and Assembler source code for the utilities, can be purchased for $3,500.

Universal can be reached through P.O. Box 3597, Evansville, Ind. 47734.

'TXTM' Handles Text and Files

WOODLAND HILLS, Calif. – The Text Maintenance (TXTM) package from Jeffrey L. Walker & Co. is said to manage the updating of program source statements in "any language," JCL procedures or "all other types" of card-formatted files in IBM-oriented environments.

It also documents all changes as they are made, the vendor added.

Controlled by parameter card entries, TXTM can be used under most IBM 360/370 operating systems and on Univac Series 70 (ex-RCA Spectra) gear as well, Walker said.

Each of the "books" (programs or other TXTM-managed entries) is posted to a random file. There it is identified by a unique book name, user identifier and version number and, optionally, provided with a password/keyword.

Developed by Joseph Sider & Associates, Inc., TXTM allows corrections to any of the books if the user is authorized by the password option; the corrections need not be in sequence.

Each book access creates an activity record which can be printed later in various user-selected sequences, Walker said.

Commands available under TXTM allow text, in the broadest sense, to be scanned and manipulated. While the package was originally built to deal with conventional DP requirements, it now includes commands suitable to a word-processing environment as well, the vendor said.

The only restriction on word-processing with TXTM is that lines of text cannot exceed 80 characters.

TXTM runs under DOS, DOS/VS, OS and OS/VS and is available for $5,000 for the first year and $500/year thereafter or can be leased for $250/mo, the vendor added from 2069 Ventura Blvd., Woodland Hills, Calif. 91364.

'Fads' Fixes Firm's Fortunes

RICHMOND, Va. – The Fixed Asset Depreciation System (Fads) from Systems Engineering Computer Co. (SEC) includes maintenance and depreciation, report creation and depreciation projection modules.

The depreciation subsystem permits any three of five algorithms to be used for determining the maximum monthly depreciation of a given asset, SEC said.

Separate tax and book calculations, as well as accumulations, are provided and permit the user the flexibility of optimum methods for each purpose, according to the vendor.

Fads' report module, in addition to a general ledger interface, incorporates capabilities to select specific assets for groups of assets for consolidations, the vendor said.

Costing $7,500, Fads can be installed on any system which supports full ANS Cobol, SEC said from 700 E. Main St., Richmond, Va. 23219.

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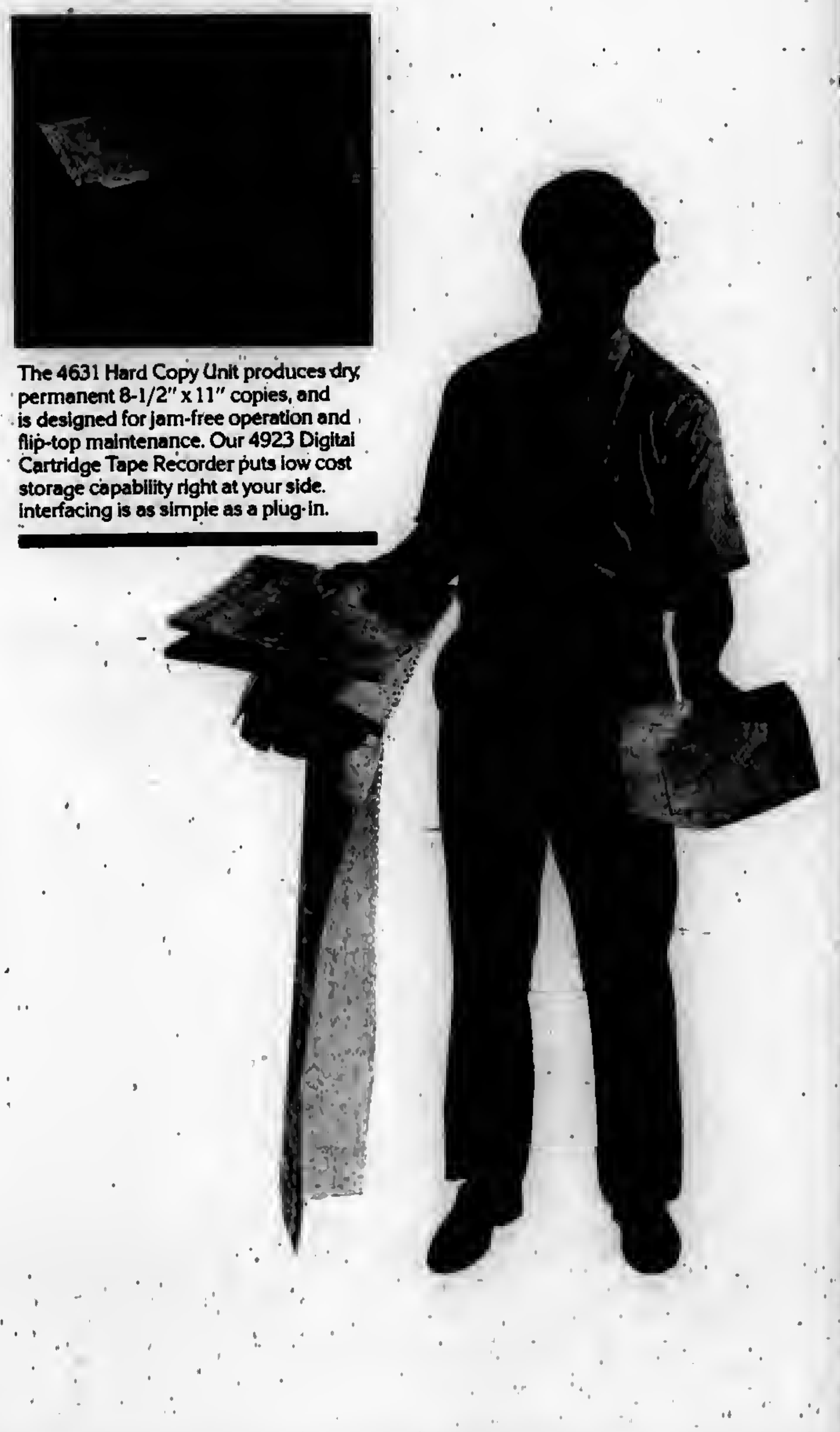

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Outfoxing Fortran Foibles

FOXBORO, Mass. – A "significant" reduction in bulk storage requirements and a "considerable" reduction in program link time for Fortran programs are among the benefits said to be derived from the Fortran Run-Time Package (FRTP) recently introduced by the Foxboro Co. for use on "any" Fox 2/30 system.

FRTP provides improvements through use of a special "Fortran Run-Time File" which contains "the most commonly used Fortran subroutines." User programs linked to this file will not contain subroutines already in the file, according to the vendor.

Savings based on use of this common file will vary depending on the complexity of the user's programs, but it is expected the average user will be able to store up to three times as many programs on his existing bulk storage device, Foxboro said.

The company is in Foxboro, Mass. 02035.

For Nonprofit Units

'EHS' Builds File of Personnel Changes

WALNUT CREEK, Calif. – Offered as a module for its Payroll/Personnel System for public nonprofit institutions, the Employment History System (EHS) from Integral Systems, Inc. (ISI) can be purchased separately for interfacing with an organization's existing applications, the vendor said.

EHS can be used for Affirmative Action and collective bargaining reporting and for studies of personnel activity over periods of time. Written in ANS Cobol, it can be used on a range of computers in different operating environments, ISI said.

The module records and dates personnel changes, including retroactive ones, in a table-defined manner on a variable-length file. In addition to logging the changes themselves, EHS records the reasons for each change as well, a spokesman noted.

The package includes facilities for updating, for periodically consolidating current period with historic data, for inputting data to simplify application programming and for displaying historic data after it has been retrieved, he added.

Any Environment

The system is not dependent on application file structures and can be installed in data base or master file environments, ISI said.

Installations may change both the format of data and the content of the history file as reporting requirements change without affecting existing programs, the vendor claimed.

An installation manual to aid users interfacing EHS with their own payroll systems is included, along with source code and program documentation, for a one-time charge of $4,500.

EHS is included in the $45,000 cost of the complete ISI Payroll/Personnel System, the spokesman said.

ISI is at 35 Quail Court, Walnut Creek, Calif. 94596.

Transferability Key to 'Citibos'

CLIFTON, N.J. – Citibos from Cybek Corp. enables an installation to utilize common application programs on machines from different makers, eliminating duplication of programming effort, according to the vendor.

The system already runs on Digital Equipment Corp., Data General, Honeywell and various other minicomputers and can be operational on other desired equipment within 30 to 60 days, Cybek claimed.

Although the syntax of the language available under Citibos forces the use of structured programming concepts, there is no fixed language at the application level. Users are free to evolve a programming vocabulary tailored to particular environments, a spokesman said.

Programming is done interactively from on-line terminals, which simplifies both original program development and maintenance efforts, he said.

Programs are independent of the data base; if the data base changes, all programs have the changes available to them but need not be modified if their functions have not changed, he added.

The language processor with Citibos is said to produce object programs that are smaller than equivalent Assembler-coded programs.

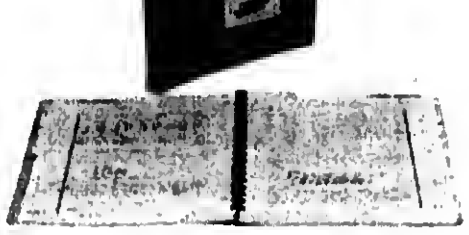
Though these programs run slower than Assembler programs, the degradation is only about 15% rather than the "500%" slowdown often experienced with high-level languages, the vendor claimed.

The Citibos software is available under perpetual license when users purchase a turnkey hardware/software system from Cybek. It is also available for $10,000 to end users who already have a mini supported by the software, the spokesman added.

Cybek is at 925 Clifton Ave., Clifton, N.J. 07013.

No.1

understand management sees is



The PLOT 10 Interactive Graphing Package includes a library of messages to guide the user along in a highly accessible conversational relationship with the computer.

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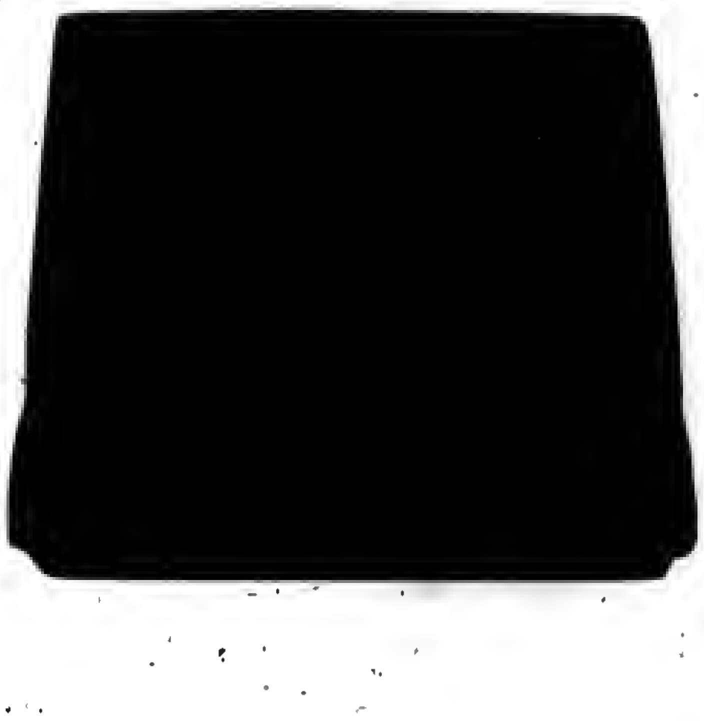


Checkout System Based on UPC

Ohio Market Ends Most Price Marking

By Ronald A. Frank
Of the CW Staff

TROY, Ohio – A supermarket here has been operating with a point-of-sale checkout system since 1974, but what makes this store unusual is that most of its items contain only the Universal Product Code (UPC) despite the nationwide consumer resistance to the elimination of price pricing.

The Marsh Supermarkets, Inc. store uses eight NCR 255-120 checkout terminals which include scanners that detect and register the data stored on the UPC labels.

As each UPC-marked item is scanned, the code number is transmitted to a drum file containing prices on 6,650 items. Each record in the file includes such data as wholesale cost, department number, current inventory and sales per period.

About 80% of the grocery, dairy and frozen foods in the supermarket contain the UPC marking and no prices. In addition, 12% of the produce and meats packaged in the store are UPC-marked and also price-marked in a special labeling area.

CW Photos by R. Frank

Store clerk runs item over UPC scanner next to checkout terminal while customer watches.

On these latter items, the UPC label is used to record item velocity and sales information; the price is necessary since each produce and meat item has a different weight and a different price.

The scanning operation has been working in the store for about two years and may have been one of the first full-scanning systems to be installed. It was the pilot system for NCR, according to Brad Hall, manager of food and drug systems, marketing.

When the Marsh system was first installed, the store undertook a six-month education campaign using bag stuffers and other methods to explain the system to shoppers.

Today, however, customers seem disinterested in the system and appear to take it for granted. A visitor to the store recently saw little evidence of customer concern about the lack of price marking.

Within the next few months, the 726-401 terminal processor will begin to operate on-line using binary synchronous transmissions to an IBM 370/125 with a 3704 front end located at the Marsh DP center about 80 miles away near Muncie, Ind.

To Include 3650s

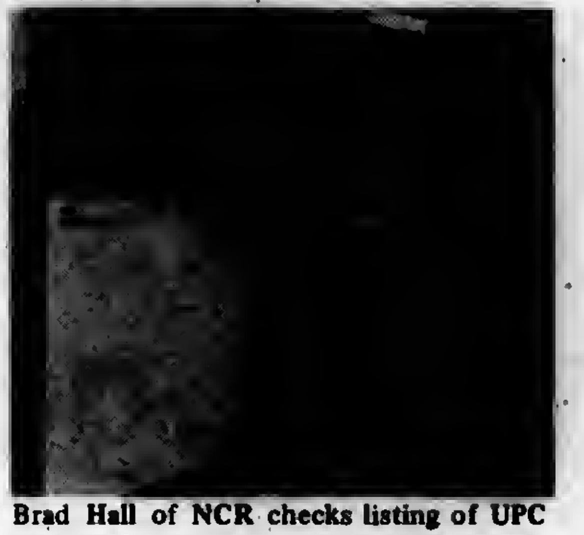
Eventually, the eight-terminal NCR checkout system will be connected to the 370 along with several IBM 3650 supermarket checkout systems which Marsh plans to install, Hall said.

Marsh paid about $114,430 for the terminal system, which it purchased. It currently pays $660/mo for NCR maintenance.

There have been few equipment problems, but some of the UPC labels cannot be scanned by the checkout terminals. UPC markings don't register well on waxed and flexible surfaces such as milk cartons and plastic bags, Hall explained.

Since the store is dependent on the UPC item data base, an uninterruptible power supply system can operate three checkout lanes for 50 minutes in the event of a power outage, he noted. In addition, a second 726 processor with a backup UPC data base can take over if the primary processor with its drum data base goes down.

Claude Finstermaker, assistant manager at Marsh Supermarket, changes UPC price information from manager's terminal. Overlay on keyboard allows manager to alter UPC data base.



Brad Hall of NCR checks listing of UPC data base next to 726 store processor with drum storage unit. Microcode for the 726 is loaded from cassettes.

Tymnet Asks to Be Value-Added Carrier

WASHINGTON, D.C. – Tymshare, Inc. has filed an application with the Federal Communications Commission (FCC) to operate its established Tymnet network as a value-added common carrier.

Tymnet is currently operating under the shared-use provisions of AT&T's private line tariffs and bills its customers under contractual agreements instead of under regulated tariffs.

Under the application filed with the FCC, Tymnet would operate as a regulated common carrier subsidiary of Tymshare and would bill customers according to tariffs approved by the commission.

Tymshare said it is requesting the change to regulated status because it plans to make network improvements, including a store-and-forward capability that would allow its customers to handle their internal administrative messages.

Tymnet will become a regulated competitor of Telenet Communications Corp. if its application is approved by the FCC. Telenet recently sent an informal complaint to the commission claiming the Tymnet network was actually providing value-added services that must be provided by a common carrier.

Tymshare answered the Telenet complaint by stating it was operating within the requirements of the AT&T shared-use tariffs.

The Tymnet network currently serves 34 users who operate 52 host CPUs on the network. Rates filed with the FCC are the same as Tymnet customers are now paying for the service, a Tymshare spokesman said.

Four Share Top User Ratings for CRT Performance

By John P. Hebert
Of the CW Staff

DELRAN, N.J. – Users of alphanumeric display terminals made by Datamedia Corp., Singer Business Machines, Teletype Corp. and Ann Arbor Terminals, Inc. rated their machines higher in overall performance than did users of other such terminals in a recent survey conducted by Datapro Research Corp. here.

Terminals manufactured by Applied Digital Data Systems, Inc. (Adds) and Four-Phase Systems, Inc. also received high ratings in overall performance.

IBM displays were the most widely used, according to the survey results, "All About Alphanumeric Display Terminals." The 54-page report includes responses from 575 users at more than 400 sites with a total of 14,103 installed display terminals from 73 vendors.

Accounting for those terminals, Datapro noted 258 users rated 7,691 IBM terminals. Fifty users had 442 Hazeltine CRTs, while Burroughs Corp. was represented by 30 users with 569 displays.

In the survey, users rated terminals on a scoring system with 1 representing "poor" and 4 representing "excellent."

In the category of overall performance, the Ann Arbor Terminals Series 200 scored 4.0 along with the Datamedia 1500 series, Singer Model 82 and Teletype Model 40, the report said.

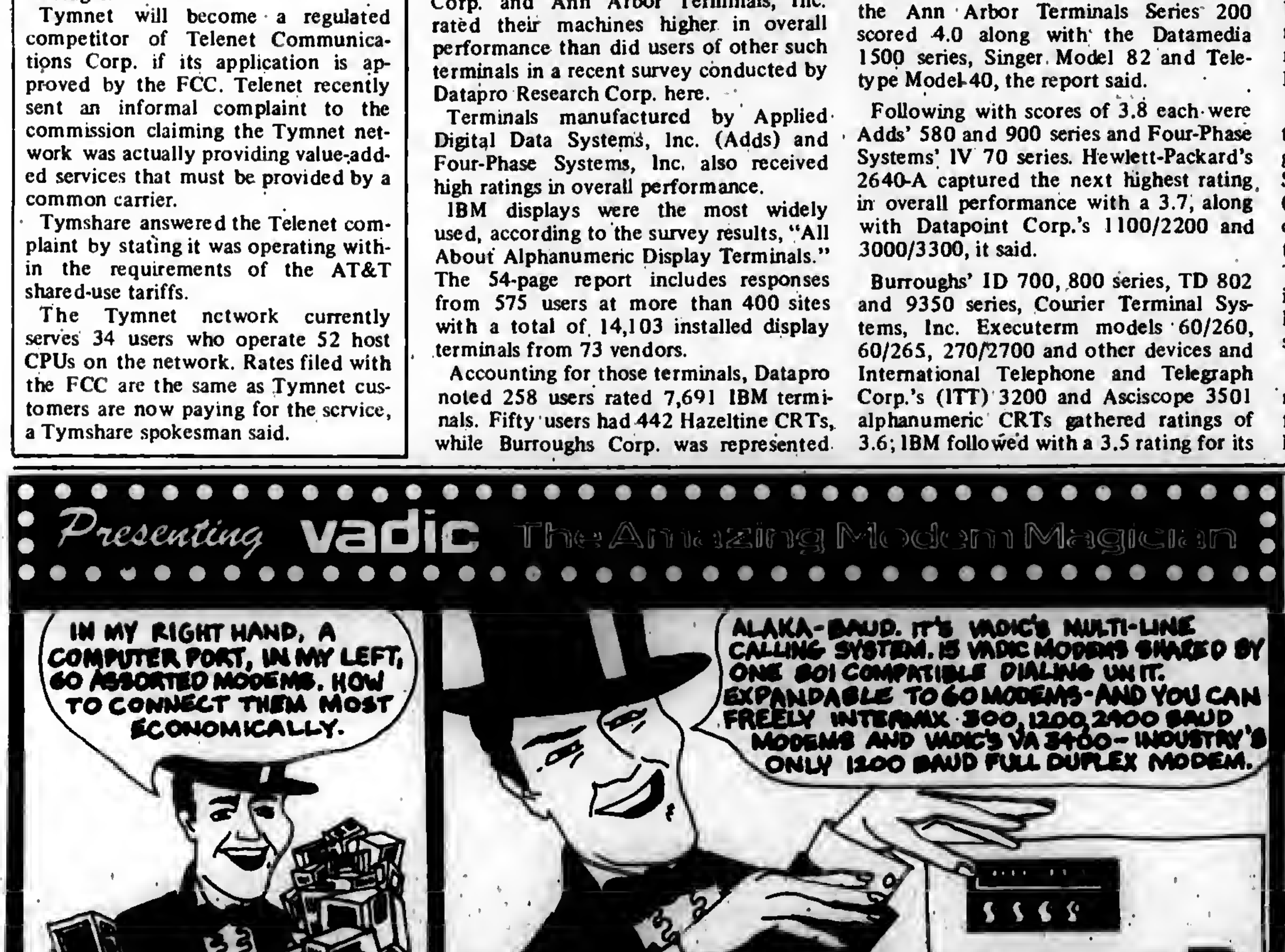
Following with scores of 3.8 each were Adds' 580 and 900 series and Four-Phase Systems' IV 70 series. Hewlett-Packard's 2640-A captured the next highest rating in overall performance with a 3.7, along with Datapoint Corp.'s 1100/2200 and 3000/3300, it said.

Burroughs' ID 700, 800 series, TD 802 and 9350 series, Courier Terminal Systems, Inc. Executerm models 60/260, 60/265, 270/2700 and other devices and International Telephone and Telegraph Corp.'s (ITT) 3200 and Asciscope 3501 alphanumeric CRTs gathered ratings of 3.6; IBM followed with a 3.5 rating for its 2260, 3275, 3277, 3270 and all others, according to the survey.

While the users' ratings of software and technical support were somewhat higher overall than last year's Datapro survey, both IBM and the independents still have much room for improvement in what the research company called "this increasingly important area."

The most notable terminal products, in terms of high scores in all or most categories, were the Ann Arbor Terminals Series 200; the Adds 580 and 900 series (whose lowest scores were 3.5 for ease of operation); the Datamedia 1500 series; the Hewlett-Packard 2640-A; and the Teletype Model 40, with two users scoring it high except in the category of hardware reliability, where it received a score of 3.0.

"All About Alphanumeric Display Terminals" is available for $10, Datapro said from 1805 Underwood Blvd., Delran, N.J. 08075.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Net Cuts Insurance Policy Processing Time to One Day

NEW YORK – A national insurance company based here is using a communications network to reduce the time to process applications for homeowner's insurance from a matter of weeks to one day.

Home Insurance Co. (HIC) uses a network of communications terminals located in its field offices and terminal controllers at HIC's central computer facility here.

The system previously used to generate homeowners' policies entailed mailing applications to the home office where data was keypunched into cards for computer entry.

The processed output was mailed back and, depending upon mail service and computer backlog, documents were returned within two to three weeks.

Now, after a local HIC office receives the application from any of its 7,000 independent insurance agents from 50 field offices, it is sent to a Memorex 1280 cassette terminal in New York, over standard dial-up phone lines at 1,200 bit/sec.

There are 20 different phone lines accessible by dialing one number, so there is little chance of waiting for an open line. The 20 phone lines connect to a Memorex 1270 terminal control unit which automatically translates the terminal's Ascii transmission code into Ebcdic used by the IBM 370/168 CPU and vice versa for communication in the other direction.

The information on the applications for insurance is collected on tape by the mainframe at the company's central compuler facility. At the end of each day's business, the tapes aro processed on the system by a special evening DP group.

Summary for Local Office

After dialing the computer the next morning, the local office receives a list of all processed items available from the work transmitted the day before.

This summary is basically an acknowledgment of receipt of the applications, assuring none was misplaced. It also indicates the applications' status, such as policy processed or policy rejected because of missing information or improper coverage.

Minimum Requirements

The central computer also checks things such as minimum state requirements and whether the policy application meets them.

The computer evaluates applications based on which zone the home is in, building material, age and whether different options such as off-premises coverage are included.

Data on Command

Upon command from the operator of the remote terminal, the central computer sends the policy information. It is received and stored on tape by the cassette terminal.

After all policy information is received on cassette, the operator will disconnect from the computer and load the terminal's hard-copy printer with appropriate blank policy forms. Completed policies are printed at 120 char./sec.

The terminal's cassette storage also allows for unattended receipt of transmissions at any time, should this be desired.

Policy printing can be accomplished at the convenience of the remote offices; the cassettes are retained temporarily as a backup against information loss.

Units Evaluated

According to officials at the insurance company, an extensive evaluation was made of 20 competitive units before the selection of the communications equipment. The equipment required no modification of existing programs or software to accommodate it to the mainframe computer, the officials noted.

Courier Adds 278 Mini CRT

PHOENIX – The Courier Terminal Systems, Inc. 278 Mini-Display CRT lerminal has been added to Courier's 270 family of display systems.

Designed for high-volume, short-message applications, the 278 is compatible with the IBM 3270 display terminal and can be intermixed with any of Courier's 270 display and printing devices, according to the company.

The terminal design features a nonglare/tilt screen, flicker-free display and a separate keyboard, it said.

It can be connected to Courier controllers including local and remote types and to the firm's virtual terminal line controller (VTLC), the company said.

Supports SNA

VTLC has been designed to support IBM's System Network Architecture (SNA)-like networking without complete central system upgrade, it noted.

The 278 can be purchased for $2,495 or leased for $70/mo on a three-year, full-service contract, Courier said from 2202 E. University Drive, Phoenix, Ariz. 85034.

Tape Winder Collects Dispensed Paper Tape

NORTHBROOK, Ill. – Data Specialties, Inc. has added the Model TM-230 utility tape winder to collect paper tape that is dispensed by readers, perforators, teletypewriters or other similar equipment.

The device uses a tape tensioning arm which turns the take-up motor on only when tape is moving, thereby reportedly eliminating the need for a continuously running motor.

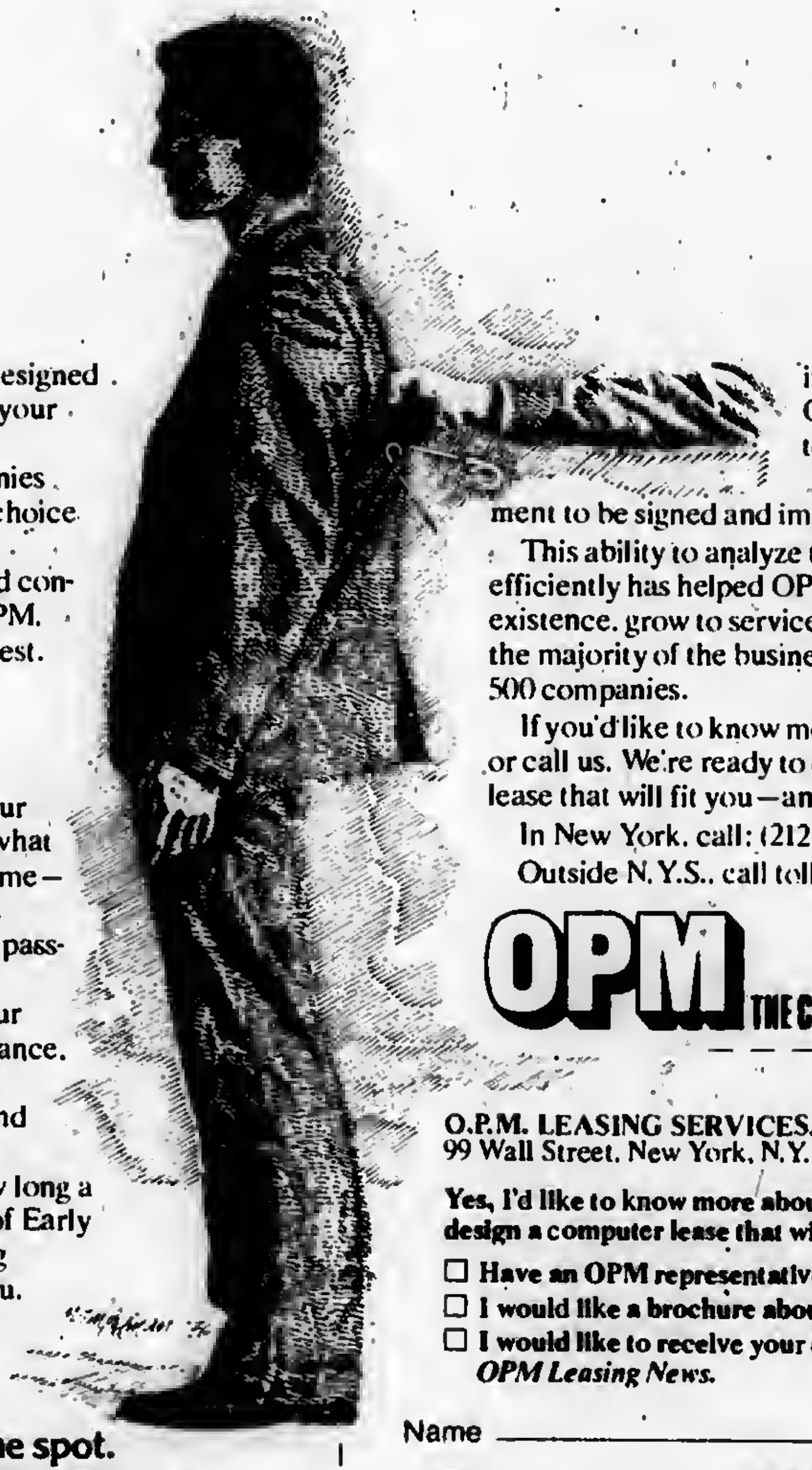
The winder is supplied with an 8-1/2-in.-diameter separable reel and is priced at $92. Data Specialties is at 3455 Commercial, Northbrook, Ill. 60062.

Correction

The AT&T Multi-Schedule Private Line (MPL) rates [CW, April 26] for a 15-mile circuit have only a flat monthly fee without an additional mileage charge.

The flat fee without any other charge applies only at distances of 1-, 15-, 25-, 40-, 60-, 80-, 100- and 1,000 miles. For circuits with other distances, the cost is based on a flat fee plus a monthly mileage charge.

Users should consult the complete MPL interexchange rate plan when estimating the cost of a specific circuit.



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Requirements Come First

Tariffs Called Only Part of Net Picture

By Esther Surden

Of the CW Staff

LOS ANGELES – Tariffs really don't mean very much unless the user first looks at the entire system and determines its requirements, according to Harvey Weiss, president of Weiss and Associates in Denver, Colo.

Speaking at a Computer Caravan workshop on data communications transmission alternatives here recently, Weiss gave a short tutorial on networking and some advice to users on how to go about making networking decisions.

The user should document the individual network's systems requirements and write down the knowledge needed to develop the net, he said.

"Clear away the symptoms," Weiss suggested, and concentrate on the problems to help define the network.

"Everybody tells me, 'I want data communications but I only want the latest technique,' but you should look at systems development in terms of system objectives," he advised.

"Until you know what the approach is, you can't say what the best" or most cost-effective alternative may be, he told the group.

"Many data communications people say, 'I want 100% uptime,' so they build full redundancy – which may not be necessary from a system standpoint," Weiss said.

Tariffs tell the user nothing, Weiss added, not only because they are difficult to interpret. If, for example, the user must transmit 129 characters of data on a packet-switching system, the cost-effectiveness of that method may disappear.

Most packets transmit 128 characters per packet, he explained.

The most important thing is cost justification, Weiss emphasized.

Two Types of Processing

Because users should know the point from which they are starting, Weiss outlined the various aspects of a communications network.

Two types of processing go on within the communications framework, Weiss said. Data processing differs from data communications because, in data processing, the system only compiles a record.

In data communications, however, the system keeps track of the kind of terminal being handled.

A communications front end was developed to take care of communications processing needs, Weiss noted.

"There isn't one information-processing machine on the market today, in my opinion, that can do both kinds of processing," Weiss told the group.

Networks can be described in terms of what hardware, including lines or terminals, is needed; in terms of geography – whether the system will be interstate or intracity; and in terms of function as a system, Weiss said.

The four kinds of line carriers users can consider are the specialized common carriers, utilities, satellites and the value-added carriers.

Terminal Transactions

Mini, Micros Form Heart Of FAI Banking System

MARYLAND HEIGHTS, Mo. – An on-line banking system with a minicomputer, dual microcomputer controllers and microcomputer-based teller and administrative CRT terminals has been introduced by Financial Automation, Inc. (FAI).

The banking system utilizes the Data General (DG) Eclipse C300 minicomputer with 256K bytes of memory in each processor. The minicomputer software, called the Foundation System, supports not only the firm's own Series 92 Financial Terminal System, but can be configured to handle any type of asynchronous and bisynchronous terminal or IBM terminal with Synchronous Data Link Control (SDLC), FAI said.

The Foundation System – a real-time monitor of banking functions – runs under DG's standard MRDOS operating system and utilizes DG's Communications Access Manager as the basis for its telecommunications, an FAI spokesman said.

Teller and administrative CRT terminals in the Series 92 incorporate Motorola M6800 microcomputers with 4K of programmable read-only memory (Prom) and 8K of random-access memory (RAM), he added.

The teller terminals incorporate a 9-in. CRT screen in a 40- by 12-character format and utilize a 40-column alphanumeric journal and receipt printer which can print multiline receipts at 110 char./sec, the company said.

The teller displays also utilize a customer personal identification number (PIN) pad and a plastic card reader at each teller window.

Series 92 administrative displays include a 15-in. CRT screen capable of displaying 1,920 characters and a choice of two printers: a Texas Instruments Corp. 30 char./sec thermal dot matrix printer or a Centronics Data Computer Corp. 120- or 165 char./sec Series 306 dot matrix printer, the spokesman said.

Telecommunications hardware in the terminal system provides total redundancy, according to the firm, through two M6800 local microcomputer controllers with up to 64K of RAM, Prom and read-only memory (ROM).

Each microcomputer controller has a built-in Universal Data Systems, Inc. 2,400 bit/sec modem to handle the terminal telecommunications processing locally in each bank branch, the company said.

Up to 32 terminals can be connected to both micro controllers; this approach allows the terminal operator to switch controllers at any time in case of controller or phone line problems without losing any transaction information, FAI said.

Among the typical applications the Foundation System can handle are on-line update of demand deposit account and savings master records; on-line inquiry for installment loan and savings club files; new account opening and file maintenance through the CRTs; on-line transaction posting and file handling; and electronic funds transfer network connection to a main computer, according to the company.

The cost of the FAI banking system varies with the size and complexity of the individual user's project. However, the price for the minicomputer equipment, dedicated phone lines operating at 2,400 bit/sec and the software installation and training can range from about $130,000 to over $400,000, the spokesman said.

Monthly maintenance on the minicomputer hardware and terminals costs $1,200 to $3,500 depending upon the level of maintenance coverage desired, he added.

FAI is located at 140 Weldon Parkway, Maryland Heights, Mo. 63043.

ABA Task Force Compiling List Of Telecommunications 'Pros'

WASHINGTON, D.C. – The Telecommunications Task Force of the American Bankers Association (ABA) is assembling a mailing list of voice and data communications professionals in banks.

The purpose of the list is to obtain the in-depth information required to assist bankers in examining their telecommunications needs, as well as to gather responses to proposed communications regulations, the ABA said.

"Each individual placed on the list will be expected to participate in identifying the needs, objectives and priorities regarding telecommunications for banking," according to Charles Donaldson, chairman of the ABA Telecommunications Task Force.

Those wishing to be placed on the list can write to Arnold L. Kaplan, assistant director of the Operations and Automation Division, ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

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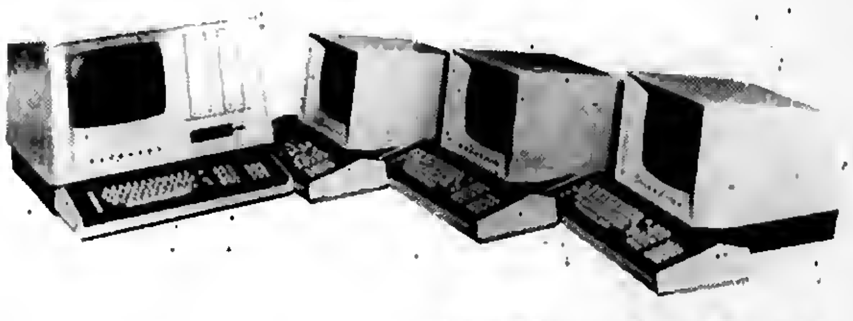

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Tape Unit Series Features 9-Track, GCR Recording

By a CW Staff Writer

BLUE BELL, Pa. – Univac has announced a series of 9-track magnetic tape units featuring high-density coded recording and error correction "on the fly."

The series includes the Univervo 30, also available in a 7-track version; the 32; 34; and 36.

With the exception of the Uniservo 36, which will be available for Univac 1100 system users only, the tape units are for users of the 1100, 90/60 and 90/70 systems, the company said.

The Group Coded Recording (GCR) technique, which records at a density of 6,250 bit/in., is 3.9 times more dense than phase-encoded (PE) recording and 7.8 times more dense than non return-to-zero (NRTZ) recording, Univac said. However, both of the later recording modes will be available in the series, the firm said.

The GCR mode is said to enable the user to correct an infinite burst of 2-track errors "on the fly." It also enables a high percentage of more-than-2-track errors to be corrected, the firm said.

The high transfer rates the series offers will reduce the amount of I/O time users take to perform tape-oriented serial file processing, Univac said.

Dual-density recording is standard with the Univervo 30 series 9-track version only, allowing reading and writing in GCR and PE modes, Univac added.

The units, which are designed to load automatically, use industry-standard wraparound cartridges, and are equipped for automatic tape threading. They also have power windows.

A radial tape interface allows each unit to be attached directly into the control unit for data transfer, AC (power) and DC (signal control) primary power.

The basic Uniservo 30 subsystem consists of a 5042 control unit and from one to eight tape units in any combination.

By adding a second control unit, the user may connect 16 tape units and obtain dual access, the company said. Special features are available with the control unit that allow recording with either 9-track or 7-track NRZI techniques.

The Uniservo 30 (Type 0872-00/01) is a 9-track PE and NRZI tape unit with a transfer rate of 320 kbit/sec at 1,600 bit/in., and 160 kbit/sec at 800 bit/in.

Tape speed is 200 in./sec. The 30 rents for $906/mo including maintenance, and purchase price is $34,800.

The Uniservo 30 (Type 0872-02/03) is a 7-track NRZI tape unit with a transfer rate of 160 kbit/sec at 800 bit/in.; 111.2 kbit/sec at 556 bit/in. and 40 kbit/sec at 200 bit/in. Rental and purchases prices are the same in both 7- and 9-track models.

The Uniservo 32 (Type 0873-00/01) is a 9-track tape unit designed for GCR and PE recording. The transfer rate if 470 kblt/sec at 6,250 bit/in. and 120 kblt/sec at 1,600 bit/in. The tape speed is 75 in./sec, the company said. The unit rents for $822/mo including maintenance, and purchase price is $31,584.

The Uniservo 34 (Type 0873-02/03) is a 9-track tape unit designed for GCR and PE recording. The transfer rate is 780 kblt/sec at 6,250 bit/in. and 200 kbit/sec at 1,600 blt/in. Tape speed is 125 in./sec. The 34 rents for $940/mo including maintenance, and purchase price is $36,192.

The Uniservo 36 (Type 0874-00/01), available for 1100 series users only, is a 9-track tape unit designed for GCR and PE data recording. Transfer rate is 1,250 kbit/sec at 6,250 bit/in. and 320 kbit/sec at 1,600 bit/in., with tape speed of 200 in./sec. The 36 rents for $1,012/mo including maintenance and sells for $38,880.

A basic Uniservo control units for 90/60 and 90/70 computer systems rents to $1,442/mo including maintenance and has a purchase price of $55,392.

An unbuffered Uniservo 30 control unit for 1100 series computer systems rents for $1,727/mo including maintenance and has a purchase price of $66,336.

A buffered Uniservo 30 control unit for 1100 series computer systems rents for $1,884/mo including maintenance and has a purchase price of $72,336.

Memorex Spawns 3340-Type Drives

SANTA CLARA, Calif. – Memorex has entered the arena for 3340-type disk drives with the introduction of its 3640 unit that is said to be typically priced at 15% to 20% less than the comparable IBM drives.

Using Winchester-type technology wlth read/write heads, spindle and circuitry as part of the data module, the 3640 can be attached to IBM 370/155s and up.

The unit can be intermixed with 3340s from IBM, Memorex said, or can replace those units.

While compatible with the IBM unit, Memorex said the 3640 has "an advanced design volce coil servo system" that offers a 20% faster average seek time (20 msec for the 3640 vs. the 25 msec for the 3340).

The 3640 may be made up of a 3643 disk drive module and controller and up to three additional 3640 modules for a maximum subsystem capacltyof 559.1M bytes, Memorex said.

Scheduled for delivery in July, the Memorex 3640 with eight-spindle capacity costs $4,735/mo on a 24-month lease with rotational position sensing while the comparable IBM units costs $5,590/mo on a 24-month plan, Memorex said from San Tomas at Central Expressway, Santa Clara, Calif. 95052.

Early Participation of Attorney Buffers Gear Choice Headaches

By Esther Surden
Of the CW Staff

LOS ANGELES – "Bring in your attorney right in the beginning," because he can save headaches in selecting among equlpment alternatives, Robert Schlick of GTE Data Services said at a Computer Caravan session here recently. The attorney should work nights with the DP department, he added.

Schlick told the group there are many viable alternatives available to the large system user. All of them require the advice of a good attorney, he said, to eliminate untenable contract clauses or add performance criteria.

Users have the choice of renting mainframes on a month-to-month basis, renting for an extended period of time (2 to 4 years), going to third-party leasing, purchasing or going to a service bureau for part of the workload, Schlick said.

Month-to-month rental gives the user a great deal of flexibility and more dealing power, and 50% or more of the rental can be applied to the purchase price, Schlick said. However, there is a high cost factor with additional usage charges, which for IBM can be extensive, Schlick said.

An extended term rental can save about 16% over month-to-month leases; tax investment credits can apply; and there are no additional usage charges. There arc also fixed costs for budgeting, hc added. However, the person who leases a system this way loses a lot of the flexibility associated with leasing, he said.

Third-Party Leasing

Third-party leases usually provide a 25% cost advantage, but usually the people who lease the system want to take the tax investment credits, Schlick said. With the third-party lease, the user is locked into a payoff penalty should he want to gct rid of the system, he added.

The method GTE Data Services uses is a combination of an extended term agreement to check out a piece of equipment and then purchase of the gear.

Purchasing represents the ultimate in cost savings; write-offs can be taken as you want, Schlick told the group.

Selection of a mainframe "should be considered with the exact kind of workshop your shop uses," he warned. "We've made it a rule to go to some organization that has the machine and run those types of jobs under a loaded configuration," because the benchmarks supplied by the vendors are sometimes inaccurate, Schlick said.

AKS Offering Data Entry Audit

NEW YORK – "Data Entry Department Audit," a service said to assure companies optimum operating efficiency in their data entry department, is now being offered by Advanced Keyboarding Systems (AKS).

The product covers the evaluation of and recommendations for the following major areas:

- Operator performance. The skill level of each data entry operator is measured against performance standards.
- Work flow. A diagram of current work flow is produced, and recommended redesign of the work flow process is developed.
- Physical environment. Within the framework of existing restrictlons, suggestions for environmental improvement are detailed
- Organizational structure. In large data centers, AKS studies present organizational structures with the primary emphasis on communications
- Salary policies. Review of current compensation policy is conducted and measured against industry standards.
- Staffing caliber. Depending on the type of equipment and documents to be processed, this activity evaluates operator qualifications.
- Employee policies. Policies are reviewed and evaluated to identify any conflicts with work flow and scheduling requirements and operator motivational factors.
- Morale. AKS identifies legitimate reasons for employee dissatisfaction.
- Department operating budget.

The time required to conduct the audit depends upon the size of the data entry department and current state of documented procedures. For a typical data entry department of 25 workstations, the audit requires approximately four weeks at a fixed price of $4,500.

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More Sophisticated About Financing

Big Systems Users Cited in Rise of Long-Term Leasing

By Esther Surden

Of the CW Staff

SAN FRANCISCO – The major change in equipment financing in recent years is "the increasing acceptance of long-term leases in the peripheral and mainframe area," according to Robert Teichman, regional manager for Crocker Bank Leaseplan.

The change is a result of two factors, Teichman told a Computer Caravan workshop on financing alternatives here recently.

First, the manufacturers just don't have the money to support month-to-month rental, he said, but the more important factor is the increasing level of sophistication on the part of the user.

Whatever financial alternative is chosen, Teichman said, the decision should be based on "what the system is going to be worth over [its] useful life.

"If you can determine the useful life of the system would be over three years, then you should look at a long-term lease plan," he advised the workshop attendees.

Three Alternatives

Teichman defined the financing alternatives available to users as rental plans, lease plans and financing plans. Rental plans are generally month to month and the user can return the equipment at virtually any time.

Lease plans can be gotten for almost any length of time, and financing plans go through a bank, he explained.

The great advantage of rental plans is that they can be canceled on short notice. This is very useful for peripherals "because of the great deal of obsolescence in this industry," he said.

Rental also includes the maintenance cost for the equipment, he noted.

Lease plans can have great flexibility, Teichman said. "You might have a system on which you can get a 30-month lease that you can trade in after the 30 months, upgrade or even choose to buy" after the user has paid in 50% of the rental, he added.

"In very large systems, there is a great use of leverage leases" which assume a full market value at the end of the lease term. The investor or lessor looks at the residual value of the equipment, Teichman said.

A leverage lease involves a lessee, an equity participant who is "somebody who buys 20%" of the equipment and a source of financing such as a bank.

"Documentation is quite a job for this kind of lease," so usually only very large system users take advantage of them, he said.

Lease plans are also coming from the computer lessor who buys a system for his inventory and then leases it to an account. More and more lessors are offering long-term, full-payout leases.

The finance lessor allows the user to define exactly what it is he wants in the equipment and offers full payout. At the end of the lease, the user has "100% financing," Teichman continued.

"The decision on how to finance a computer is more and more falling into the treasurer's office," he added.

Some important hints about financing alternatives were added by George D. MacKay, equipment leasing officer for Crocker Bank Leaseplan.

Users should be aware that they are apt to get used systems if they rent equipment, MacKay said.

Also, if the user chooses to rent because of a cash flow problem, he should know about the cash outlay for software and the additional charges for a third shift.

For customers who aren't certain of whether they want to make a long-term investment in a long-term lease, the best plan may be to rent for a year then change to a lease program after that, MacKay suggested.

Net Helps Six Counties Trim Welfare Costs

CINCINNATI – Six Cincinnati area counties have joined forces with a computer to hold down welfare costs.

And even though caseloads are increasing at an annual rate of 30%, their system helped trim $355,000 last year from food stamp and other welfare assistance programs, according to Seth P. Staples, Hamilton County welfare director.

The IBM 370/135 keeps status files on 200,000 welfare recipients in the six-county network, which is comprised of Hamilton (Cincinnati), Brown, Butler, Clermont, Clinton and Warren counties. The computer is installed at the Hamilton County Welfare Department, which manages the network.

During 1975, the network's first full year of operation, computerization saved $262,000 in Hamilton County, $60,000 in Butler, $18,000 in Clermont, $9,000 in Warren and $6,000 in Clinton. (Brown County joined the network in March 1976.)

Besides cutting administrative costs, the computer has helped the counties stop fraudulent applications for aid from two or more counties at the same time, Staples said.

Each county uses its display terminal to cross-check each other's records to be sure every recipient is receiving payments only from the county in which he is eligible.

Agency officials from all six counties agree that overpayments have been virtually eliminated; because the computer checks all eligibility charges and calculates the amount of each individual financial grant, benefits are always current.

Staples said the computer has allowed the size of his administrative staff to remain relatively stable during the last five years, despite a 30% increase in the number of Hamilton County welfare recipients.

"Figuring budgets and filling out forms used to take up as much as 40% of our caseworkers' time," Staples said. "Now, they can spend more time on the job they were trained for – casework in the field."

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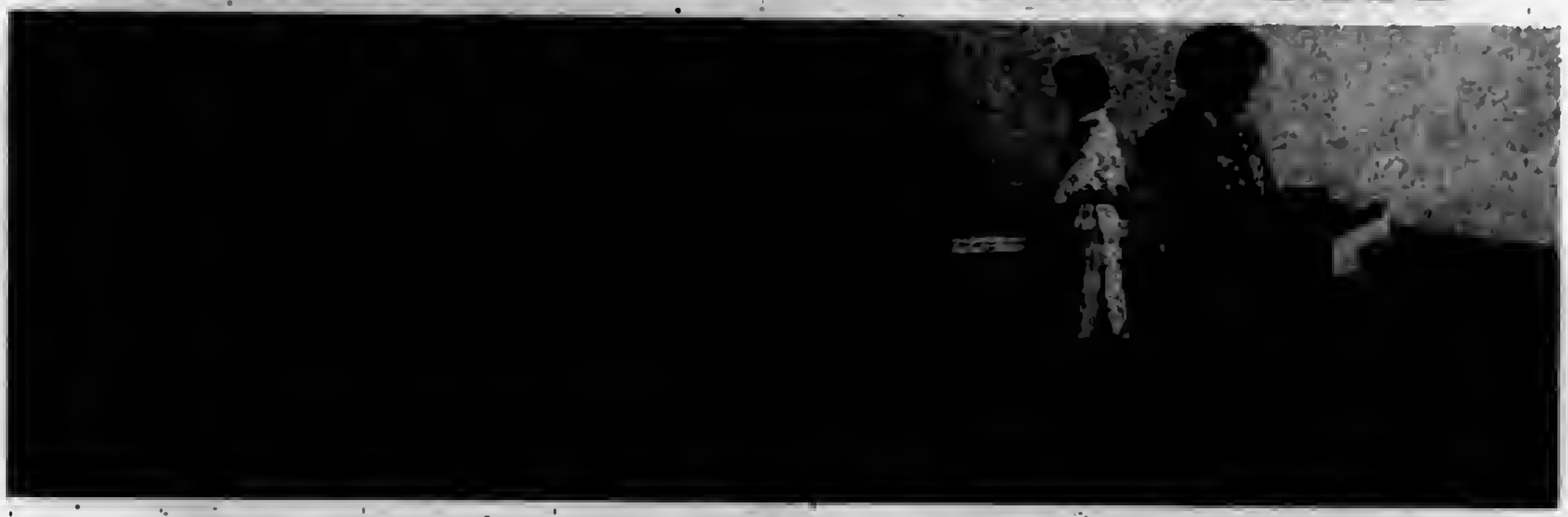

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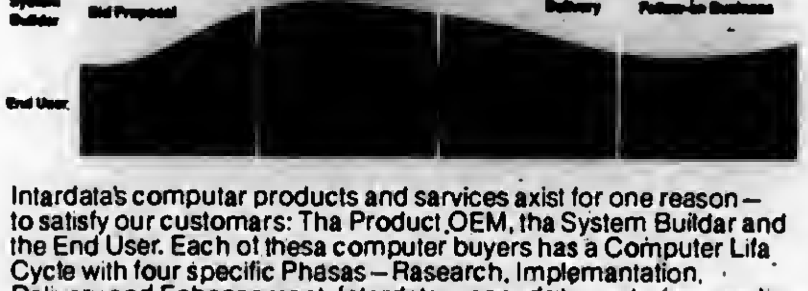

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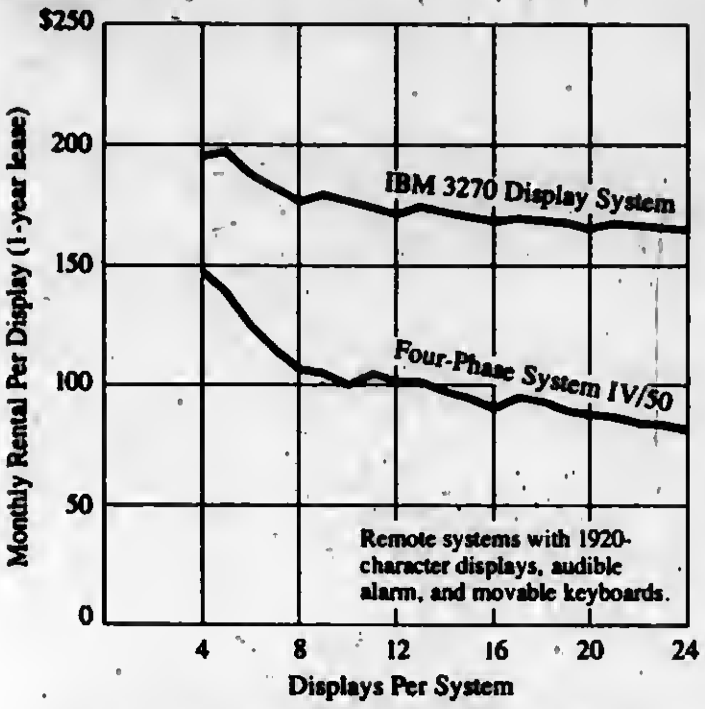

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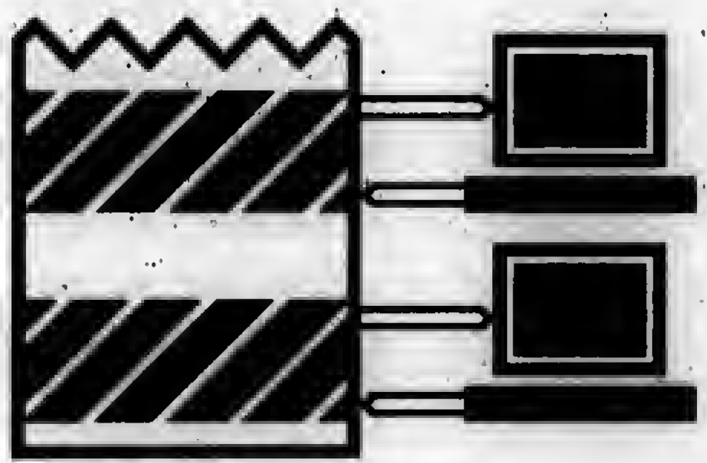

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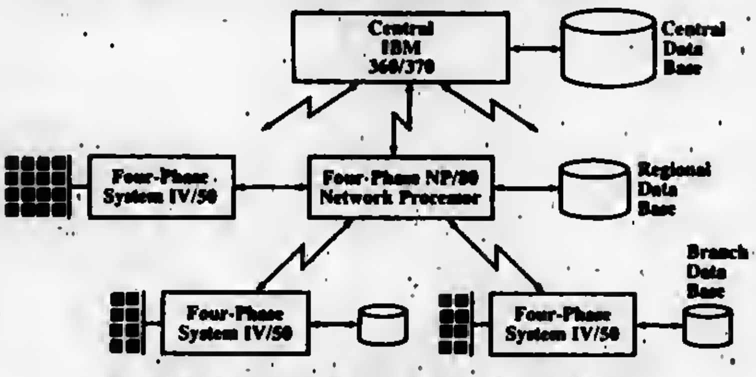

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N.Y. System Matches 213,000 Workers, Jobs in Year

NEW YORK – The New York State Department of Labor used a computer system to place 213,000 persons in jobs in private industry in this city in the most recent fiscal year.

Use of a computer system is the most economical and effective method known to match workers with jobs in New York's fast-changing market, according to Dr. Philip Ross, state industrial commissioner and head of the department.

The department's citywide Job Bank Screening System includes computer terminals in the 32 field offices, allowing instant matching of available jobs with an applicant's qualifications.

On one recent typical day, 6,000 jobs ranging from "materials handler" to "nuclear physicist" with salaries up to $40,000 were listed in the job files. About 500 applicants were placed that day.

Last December the department placed 15,700 applicants. In October, traditionally the busiest month for job placements, 20,200 openings were filled.

Employers inform the service of available positions and the necessary qualifications.

Jobs are entered into an IBM 370/165 mainframe in Albany. The 370 has 3M bytes of main memory and an additional 2M bytes of IBM peripheral memory and 1M byte of memory from Cambridge Memories, Inc.

Access to Wider Area

"An important advantage of this computerized system over the old manual method is its flexibility, speed and access to jobs in a wider geographical area – the whole of Metropolitan New York," according to Virginia Browner, metropolitan area director of manpower services.

"Previously, an interviewer in a field office had only his own job file with which to assist an applicant. If he wanted to extend his area of search, he would have to write to other field offices or call other interviewers, hoping they would have something. That, of course, took too long and usually wasn't even feasible."

Of the 32 field offices, 19 specialize by occupation or profession: commercial, apparel, industrial, service, household, hotel and restaurant. An applicant at the appropriate office fills in a form, listing his requirements in order of importance; salary, position and location are generally the most important of 26 criteria.

After an applicant is interviewed, the application is entered through an IBM 3767 terminal and transmitted to the Albany computer. The computer searches through the job bank and immediately sends back to the inquiring office a list of several job possibilities for the applicant to follow up.

Two Search Types

"The interviewer can request either a "soft" search or a search based on occupational codes listed in the 18,000-entry Dictionary of Occupational Titles [DOT], Ronia Solar, coordinator of manpower data systems, said.

"The soft search is by general work field – for example, 'merchandising' or 'research' – as well as an applicant's aptitude, interests, temperament and/or vocational training.

"The occupational code search is more specific. A code number from the DOT is used to look for specific jobs; the number of coded digits entered into the terminal determines how extensive a search the computer makes – the more digits, the more specific the search; the fewer digits entered, the broader the search," Solar said.

The applicant's qualifications are graded by a scoring system. The computer finds the first five openings closest to matching that score – or the next five on a subsequent search.

The system can search beyond the top requirements if nothing in the computer file matches. It is up to the interviewer and applicant to determine whether any of the openings are suitable.

The efficiencies generated by the system have benefitted employers, applicants and state employees, according to Alex Altheim, placement director.

"The system has improved chances for an applicant's placement by giving him instant access to openings in a very wide area; the employer now has a potentially larger field of applicants from which to make a choice; and our own department is making much better use of tax money and its own resources, since interviewers can help far more applicants in a day, but must still use their own judgment in working with the computer," Altheim said.

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Uses Sybol Language

CAI Syfa System Designed for Distributed Processing

By Esther Surden
Of the CW Staff

IRVINE, Calif. – The Syfa interactive business system introduced by Computer Automation, Inc. (CAI) here last week is specifically designed for commercial distributed processing applications, a spokesman said.

The system is well-suited for OEMs and Fortune 1000-type companies with multiple divisions, each with individual data processing requirements and the need to communicate to a central-host, he added. The Syfa system can accommodate both interactive and batch requirements, CAI said.

Syfa features Sybol, a business-oriented high-level programming language introduced with the system, CAI said.

Also introduced for the system was CAI's own Syfa information station CRT with a standard typewriter keyboard and a calculator-like keypad, the firm said.

A basic Syfa system, including a 8-port CPU with 64K bytes of core memory, one 10M-byte disk drive and software, costs $54,000 and is available within 60 days, the firm said.

The Syfa CPU is a revised version of the firm's LSI-2, CAI said, with expanded firmware and an enhanced instruction set. Memory can be accessed in 16-bit words, in bytes or in bits. The instruction set includes decimal arithmetic and character string handling, and I/O and status stacking instructions are handled by a vectored priority interrupt scheme, the firm said.

The system can thus handle multiprogramming at the hardware level, the firm said.

The system uses non-volatile core main memory with a 1,200-nsec cycle time. Core is expandable from 64K bytes to 1M bytes, it noted.

Two types of disk drives are available for the Syfa system; however, the disks cannot be mixed on a single system. One model has a fixed and removable disk, each with 10M bytes of storage. The larger drive has an 800-byte removable pack. Up to eight drives can be attached to the system, CAI said.

The drives are handled by a microprogrammed disk controller with direct memory access. Head-positioning requests for all the attached drives are simultaneously processed, the firm said.

The basic Syfa system includes an asynchronous multiplexer with eight ports; the system can be expanded to 24 ports.

Terminals can be either hard-wired to the multiplexer or use a modem for communications, the firm said. Each port accepts any EIA or CCITT device, CAI noted.

The information station introduced with the system has a CRT and a detachable keyboard. The screen displays 24 lines of upper- and lower-case Ascii, the company said.

The information station can function as a data capture station or as an interactive terminal and can communicate with another Syfa terminal or with the central mainframe with the Syfa processor acting as an interface, a spokesman noted.

The system can handle up to two printers attached directly to the CPU or any number of printers attached to the available multiplexer ports. Printers with from 100- to 600 line/min speeds are offered with the system, CAI said.

Syclops

Syfa runs under CAI's concurrent logic operating system (Syclops), which is said to support the simultaneous execution of 24 application programs, a background utility, one emulator for communications with another system and two print spoolers. Syclops incorporates virtual storage techniques, CAI said.

Utility programs for the system include a program text editor, a compiler, a sort, a file manager and a file-to-printer dump, CAI said.

End-user application programs are written in Sybol, a language said to resemble Cobol in its structure and appearance. A Sybol program is said to have immediate access to the real-time coordination of the multiple ports; activation of concurrent background utilities; communications with another system; control of terminal I/O; spooled or direct printing; and disk file creation, retrieval, alteration and expansion, the company said from 18651 Von Karmon, Irvine, Calif. 92664.

Computer Automation, Inc. Syfa System

Implementation Takes Time, Users Told

By Esther Surden
Of the CW Staff

LOS ANGELES – "If you want to be realistic, look for five to six months to pass from the time you buy to the time you have a viable system," George Tamas, president of Tamas and Associates told a workshop on in-house computers at a Computer Caravan session here recently.

Tamas examined the pros and cons of buying a minicomputer as opposed to alternatives such as time-sharing and service bureau computing.

Generally, one should use a service bureau for a business that has low-volume standard accounting applications, Tamas said. A service bureau doesn't require the user to add staff as an in-house system might and doesn't involve expensive new forms or applications design on the user's part, he said.

The investment with a service bureau is usually small and based on a dollar-per-unit cost. "If you grow, it will cost more," he warned. But one of the good things about a service bureau is "you don't have to keep it forever," Tamas said.

A disadvantage of the service bureau is that the user "will have to take what is available" even if it's not quite the way the user is doing business, Tamas said. Also, "as your volume starts to grow, you really get hurt."

The most critical disadvantage of a service bureau is slow turnaround time. "If you have time-critical applications, it can be very bad," Tamas said. Turnaround time with a service bureau ranges from two to seven days, he said.

With time-sharing the user has terminals in the offices, taking away the turnaround disadvantage, Tamas said.

With time-sharing the user "doesn't have to endure the cost of applications development" or increase staff, he added.

The major disadvantage of time-sharing is "what happens if the computer goes down?" If the user doesn't select a time-share firm carefully, he could be hurt very badly. The firms should have backup available in case the system goes down," Tamas said.

If the user decides to get a minicomputer, there are alternatives open to him. The system can be purchased outright as a capital investment, or a five- to seven-year lease can be arranged. With the lease plan, after a fixed amount of time the user will own the machine, Tamas said.

Buyers should beware of hidden costs in purchasing a mini. First, the user will have to find space for the system and modify the room environment to suit it, he said.

(Continued on Page 32)

Company Profile Seen Necessary Before Going to In-House Mini

By a CW Staff Writer

LOS ANGELES – Before going to an in-house minicomputer, users should "be prepared," George Tamas, president of Tamas and Associates, told a Computer Caravan session here.

"Develop a background profile" on your company to know where you are starting from, Tamas advised. The profile should include how old the company is, whether it is privately held or publicly owned, a gross sales history that includes a profile of recent growth, the kinds of products the company deals with and the number of divisions in the firm, he said.

An organizational flowchart should be included because, "it is very important to know who are the key individuals involved in various processes and procedures in the company."

Next, a company should list applications it is currently processing, either by hand or by service bureau. Whatever business you are in, you have a number of processes that are being taken care of, Tamas said. This becomes the system outline.

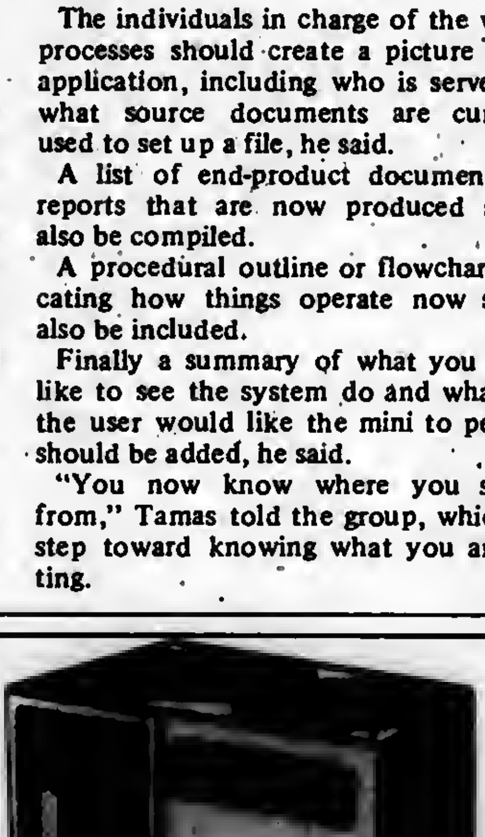
The individuals in charge of the various processes should create a picture of the application, including who is served and what source documents are currently used to set up a file, he said.

A list of end-product documents and reports that are now produced should also be compiled.

A procedural outline or flowchart indicating how things operate now should also be included.

Finally a summary of what you would like to see the system do and what jobs the user would like the mini to perform should be added, he said.

"You now know where you started from," Tamas told the group, which is a step toward knowing what you are getting.



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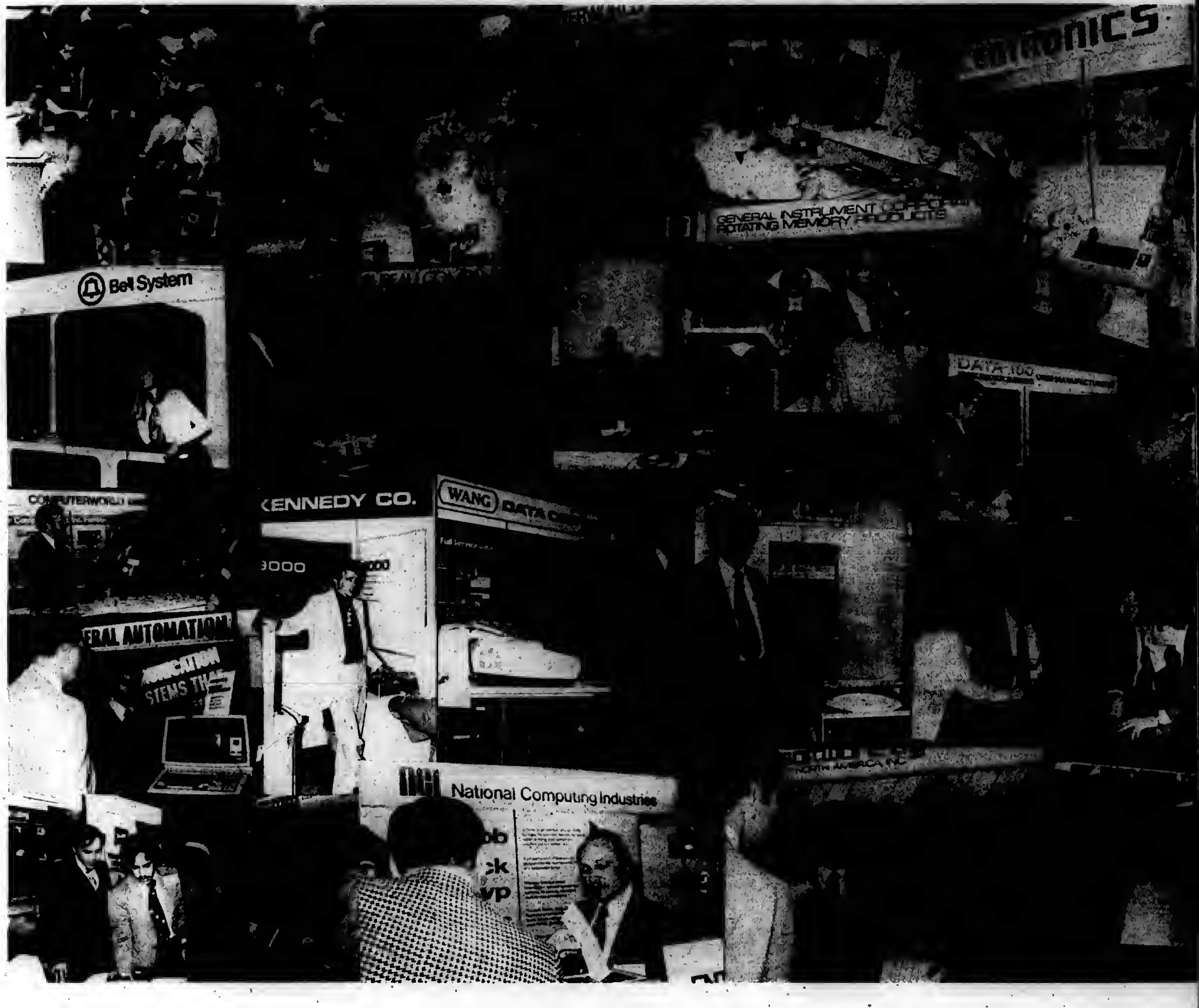

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Mini Helps Library Users Borrow Books

DALLAS – A mini-based circulation control system at the University of Texas library here allows patrons to check out books themselves while providing a theft control system that eliminates the need for security personnel, the user said.

With the system, the library patron goes to a user checkout station where he processes the book, establishing a readily available record for the library staff's use.

The circulation control system, built around a Hewlett-Packard 21MX minicomputer, was installed in the library last summer by Innovative Systems, Inc. of Dallas.

"We had some apprehension that people wouldn't readily accept the system," James T. Dodson, director of libraries, recalled.

"We thought they might resist the idea of checking out the books themselves with a machine, but that hasn't been the case at all."

The library has approximately 300,000 volumes and is expanding at the rate of 50,000 to 60,000 items per year.

Mini Checks Files

After a patron finds the item he wants to check out, he goes to one of two checkout stations and inserts a coded identification card into a card reader.

The information on the card is relayed to the mini, which checks the card number against its files to determine whether the patron is in good standing.

If the patron is approved, the system relays a message to him on a CRT at the checkout station and instructs him to insert the item in the book tray.

A bar code, containing the item's circulation number, is located on each book. A bar code scanner relays the number to the mini, which checks the number against the hold file.

If the patron's identification number matches that of the first requester or if the book is not on hold, the computer records the item as being checkout out to the patron.

When the system determines the patron at the checkout station is entitled to the book, it relays a signal to the activator/deactivator at the station, which desensitizes a detection strip in the book, allowing it to be carried past the detection system.

Noncirculating materials contain a permanently activated detection strip.

A thermal printer then issues a due date slip to the patron, completing the transaction. Each station can handle up to 1,000 transactions a day.

If the patron should "forget" to check out the book properly, the detection strip inserted in the spine of the book will remain activated, generating a radio frequency signal which is picked up by a sensing device located at one of the library's two exits, and the electronic gate at the exit will automatically lock.

Work Hours Reduced

The biggest factor in the university's decision to install the $180,000 system was the reduction in staff requirements. The library is saving 200 man-hours a week in security staff alone, Dodson estimated.

The library chose a minicomputer-controlled system after the administration studied other systems and found no standard system could meet its specifications.

The administration asked for bids, and Innovative Systems was the only firm to reply, Martin said.

The system also provides increased control over circulating materials, Dodson said.

The normal circulation period is three weeks, but it is reduced to seven days if someone places a hold on an item. A patron places a hold on a book by entering his identification card at a checkout station and then typing in the appropriate code for a hold transaction and the book's circulation number at the keyboard.

At the end of each day, the hold notices are transmitted to an IBM 370 serving three University of Texas campuses, where they are processed and mailed to each patron to whom a book on hold is checked out, informing the patron of the new due date.

Now when patrons who have the maximum number of books on loan, overdue books or library fines enter their identification cards at the checkout station, the computer relays a message back to the CRT screen informing them they must consult the library staff.

The staff can override the computer's rejection of a patron's transaction if circumstances warrant it, Dodson said.

The reach for speech, and other important topics in *Source Data Entry.*

A special report in the June 28th *Computerworld*.

Computers can process only the data they have access to. And the speed of your entire computer operation is necessarily dependant upon how fast you convert raw data to machine-readable form. That's why the data entry function has been the target of so many economizing measures over the years. And we've come a long way from the card and keypunch sweat shop environments of ten years ago. Key entry is no longer widely viewed as a purely clerical function for control clerks to balance or correct at a later time. Now there's a variety of systems that enable an operator to enter data, edit and validate it automatically, transmit it to the host computer and then receive the interpreted data, all with the same equipment. And we'll look at how organizations are using systems like these to increase the economy and utility of their computer operations.

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In all, you'll find in-depth summary of what's being done in the eminently practical field of source data entry. And if you have an interest in data entry methods you should be reading this special supplement in the June 28th *Computerworld*. If you're a marketer in this field, here's where you should be telling your story. Ad closing date is June 11. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Implementation Takes Time: Tamas

(Continued from Page 29)

Then the user should look at how much the software will cost and ask the question: "What are my realistic staffing requirements?"

He also told the group to be wary of vendor-supplied software packages.

The buyer should define what the reports to be produced should look like, exactly. It sometimes takes up to 90 days to come to the point where there are no discrepancies between the buyer and the vendor, Tamas said.

Define what your absolute minimum requirement is for custom software. "What you must have for this thing to pay its way from day one," Tamas told the group. "Because once you've done that, you have a luxury; the thing works," he said.

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User Picks Mini After Finding Canned Applications Too Limiting

By Esther Surden
Of the CW Staff

PHOENIX – Because an arts and crafts supplier here found canned applications programs too confining, the user picked a small business system to do its accounting jobs.

"We chose the Adam computer because our applications didn't conform to the accounts receivable packages available," according to James L. Rhodes, vice-president of finance for Crown Crafts and Notions.

"We wanted to do somewhat unique things and adaptation of existing packages for that purpose would have been very expensive," he added.

Crown looked at the Data General Corp. Nova, NCR Century series, Olivetti mini's, the IBM 32 and Basic Four configurations before settling on the Adam mini from Logical Machines Corp.

Adam is the "no software, no programmer" small business system the user himself programs with a base vocabulary already programmed into the system, Logical said.

Crown is a wholesale distributor of craft supplies, including docoupage kits, wooden beads and sewing notions; it handles about 2,000 customers nationwide.

"Every town in the world has a craft shop, it seems," Rhodes said. His company had been spending a lot of time manually keeping track of the fluctation in customers; a lot of shops go out of business soon after they open because the owners are artists, not business people, he said.

Many of Crown's customers prepay their invoices, Rhodes said, and it was very difficult to find an application package for accounts receivable that would let the firm continue operating in this way.

"We didn't want to change the way we were doing business," he said.

In addition to customers who prepay invoices, Crown has cash-on-delivery accounts and some customers who pay on account, he added.

Crown acquired the small business system in January 1975 and loaded its accounts receivable package by the first week in February, Rhodes said. He and another staff member went to Logical's training school in San Francisco for three days to learn how to use the machine.

Crown ran a parallel system on its old NCR posting machine for 60 days. At the end of that time, all necessary changes were made and the firm was pleased with the mini's output and accuracy, he said.

The Adam system includes 32K bytes of memory, a slow-speed printer, 10.6M bytes of disk and a CRT; it cost the firm $39,000, Rhodes said.

The system has allowed Crown to continue to grow, Rhodes said. The firm is considering getting a high-speed printer to replace the one that came with the system to try to cut down on printing time.

A 300 line/min printer could print the customer list in 20 minutes; it takes nearly two hours to do so now.

"I will have to learn to schedule my applications better than I have been" as more applications are added to the system, Rhodes admitted, but "I don't visualize any change in systems for a while," he said.

"The system has reduced our response time, things are posted on time, we are more efficient and our capacity has greatly increased," he concluded.

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Attention will be focused on the high leverage areas, especially methods for improving the analysis and design process. A recent Department of Defense survey showed that 64% of software errors tend to be hidden ones, and do not surface until late in the development cycle. Over half the total errors remained hidden until acceptance testing or later. Of these hidden errors, 83% were in analysis and design. These statistics emphasize that Structured Programming alone is no substitute for the structured approach to the entire development process to be stressed in this seminar.

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John W. Brackett, PhD and Prof. Clement L. McGowan are the Seminar Leaders

John W. Brackett, PhD is a founder of SofTech and is a company Vice President responsible for the development and application of improved analysis and design methods. Dr. Brackett has been a consultant to several major computer manufacturers on new program development techniques for improving programming productivity. He has presented this seminar to many large industrial and government organizations, including ITT, MITRE, United Technology, the U.S. Navy and U.S. Air Force. Together with Dr. McGowan, he developed a new graduate-level course in Software Engineering at Brown University.

Clement L. McGowan, PhD is a consultant to SofTech, and is an Assistant Professor of Applied Mathematics at Brown University. Dr. McGowan co-authored the recently published book, *Top-Down Structured Programming Techniques*. He has been a consultant to the IBM Federal Systems Division responsible for the development of many of the new methods currently receiving widespread attention. He is an associate editor of the *Journal of Computer Languages* and is a member of the IEEE Computer Society, ACM and Sigma XI.

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The charge for the entire 2-day seminar, including continental breakfasts, luncheons and all course materials is $300. Additional registrants from the same company are charged only $250. This does not include hotel rooms, if necessary, but we have reserved space at seminar hotels for attendees who wish them.

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CI Notes

HP Rings Up $3 Million In Sale of 3000s to Iraq

CUPERTINO, Calif. – The Republic of Iraq has ordered more than $3 million worth of HP3000 computers and related peripheral gear from Hewlett-Packard Co. (HP).

The 21 systems will be installed in Ministry of Industry and Minerals departments throughout Iraq after applications are developed at ministry headquarters in Bagdad.

Deliveries will begin in late summer. The order also includes 66 HP2640 CRTs with Arabic character sets designed by the customer, HP said.

Univac Develops SNA-Like Scheme?

NEWTON, Mass. – Univac is reported to be developing an approach to data communications called Univac Network Architecture (UNA).

The concept is said to be similar to IBM's Systems Network Architecture (SNA), but will not lock in the user to one specific vendor as SNA does, according to industry sources.

Univac has not indicated when UNA will be announced nor with which systems it will operate.

CIA Membership Totals 37

WASHINGTON, D.C. – Membership in the Computer Industry Association (CIA) now totals 37 with the addition of Management Assistance Inc., Nixdorf Computer, Inc. and Hudson General Corp.

Auerbach Spins Off Consultants

PENNSAUKEN, N.J. – Auerbach Corp. for Science and Technology has spun off its consultancy arm, Auerbach Associates, Inc., to a group of current management of that company and other employee owners.

Supershorts

Data Dimensions, Inc. has agreed to market Texas Instruments' Silent 700 terminals.

– – –

Computer Communications, Inc. (CCI) has signed a three-year equipment purchase agreement with North American Corp. (NAC) under which NAC will buy up to $10 million of CCI equipment for least to CCI customers.

– – –

3M Co. has formed the Information Management Department by merging its facsimile products with the word-processing and data entry systems of its subsidiary, Linolex System, Inc.

Question of Cost vs. Extras

Unbundling Seen Way to Appease OEMs

By Molly Upton
Of the CW Staff

TULSA, Okla. – One solution to the dilemma presented by OEM's preference for services from suppliers of minicomputer peripherals but their unwillingness to pay for them is unbundling, or separate pricing, according to Louis E. Schultz, head of the business management office at Magnetic Peripherals, Inc.

Schultz's survey of OEMs showed the 17 respondents ranked the offering of regionally located spare parts as the most desirable among 13 presale and postsale support services.

Seventy-one percent of those responding placed a positive value on this service and indicated they would be willing to pay an average increment of 2.2% over the product price for regional location of spare parts.

The respondents included large systems makers, minicomputer manufacturers and systems houses.

Large manufacturers indicated they would be willing to pay a 1.4% increment, mini makers 3% and systems houses 2.5%. Mini makers indicated this offering was of a greater incremental value to them than all others combined, according to Schultz.

The next highest scoring for an offering was systems integration support, which was valued at 1.6% of the selling price.

In the presales area, "the results indicate the lowest price was a more powerful factor, but various services were considered valuable to some individuals," the report on the survey results observed.

Accordingly, it is up to the OEM supplier to know his territory and evaluate whether the potential business is worth the cost to him, Schultz said.

Design Support Worth 9%

The topics for consideration under presale services and their assigned incremental values were 1% each for evaluation support and trained technical salesmen; 9% each for controller design consultation and systems design consultation; and 3% each for competitive comparison information and controller and system design publications.

Unbundling would help keep the prices of products low in the mini peripheral mart, which is marked by extreme price consciousness, Schultz said.

The respondents were more positive toward postsale support than presale support. The average incremental value of all postsale services listed was 1.6% by the large manufacturers, .9% by the mini makers and 1.9% by the systems companies.

Other items in the postsale services were responsiveness to evaluation and follow-up questions, 1.5% each; regionally located service, 1.2%; salesman's and follow-up support, 1.5%.

(Continued on Page 37)

NCR Transition Nearly Complete; Company Targets Three Markets

DAYTON, Ohio – "NCR has pretty much completed its transition into a computer systems company" and is setting its sights on three developing markets in the industry, all of which are based around the general-purpose computer, according to William S. Anderson, the firm's president.

Since 1972 NCR has invested $270 million in R&D to expand its capabilities in three markets of "above-average potential": distributed DP systems; sophisticated on-line systems; and interactive systems specially tailored to the requirements of different lines of business, Anderson said here recently.

NCR plans to spend over $100 million for R&D this year. "The general-purpose computer has been, and remains, the heart of this massive systems development program," he said.

The evolution from a supplier of free-standing mechanical business machines to an electronics company, principally a computer systems company, is illustrated by the fact that computer and data terminal revenues contributed 75% of NCR's total equipment revenues in 1975 and are expected to provide 85% to 90% of those revenues this year, he said.

"Both our mainframe business and our data terminals business have grown rapidly. Since 1972, for example, NCR's computer equipment revenues have more than doubled, for an average annual growth rate of 25%," Anderson noted.

"Last year those revenues alone reached $462 million," he added.

When other elements of NCR's computer systems business are included, total DP volume is almost $1 billion annually, Anderson said.

These other elements include revenues from unbundled software and other customer support, field engineering, data centers, the sale of DP supplies and the sale of data terminals which are part of NCR's computer installations, he explained.

"The growth of our mainframe business

(Continued on Page 37)

Hogan Stresses Cost Reduction In Computing Power With LSI

By a CW Staff Writer

BOSTON – By tossing into the audience computing power equivalent to that valued at $18 million in 1953, C. Lester Hogan, vice-chairman of the board of Fairchild Camera & Instrument Corp. recently emphasized the cost reduction of computing power that has occurred as part of the large-scale integration (LSI) revolution.

As Hogan threw 18 of Fairchild's F8 chips during the keynote address at Electro '76 here, he observed each chip contained roughly as much power as IBM's 701 machine, which cost $1 million when introduced.

The chips cost $10 to $12 each in large quantities.

Although microprocessors are the most exciting component of the LSI revolution, the movement is braoder and much more fundamental than microprocessors, alone, he said.

As another example of the declining cost of electronics, he compared the Friden electromechanical calculator, which sold for $800 or more and handled four functions, with a simple $10 one-chip calculator.

One of the most significant elements of the LSI revolution is the reduction in engineering design time for a product when one uses a micro as a component, he said.

Fifteen years ago it took perhaps 50 man-years to put together a complete working system with transistors, etc. Now this can be done in about nine man-months with a microprocessor as a component, Hogan said.

This shortened design phase has several ramifications, among them ease of finding capital for products that can be put on the market relatively quickly, he said.

Hogan claimed the electronics field has come full circle. While venture capital was readily available 20 years ago, this commodity has virtually dried up for those firms trying to start manufacturing

(Continued on Page 38)

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CW Photo by R. Frank

William S. Anderson

NCR Nearing Completion of Transition

(Continued from Page 35)

has been exceeded only by the growth of our data terminals business. During the same four-year period – since 1972 – NCR's sales of data terminals have increased sixfold.

"Last year they totaled $460 million, a gain of 55% over the prior year," he stated.

Claims 7% of World Base

Anderson estimated NCR's computer user base at over 20,000, which he said represents about 7% of all the general-purpose computers installed worldwide.

About 5,000 of those sites are comprised of Century computers. The remaining installations are smaller systems, primarily NCR 399 minicomputers, he said.

Sees Revenues Over $2 Million

The transition from mechanical to electronic systems enabled NCR last year to exceed $2 billion in worldwide revenues for the first time in its history. "We expect to do better than that in 1976," Anderson said.

"Certainly our bookings for the first quarter of this year point in that direction. Here in the U.S., total incoming orders through March were up 62% over the comparable period of last year.

"In fact, March domestic bookings were the highest ever recorded by NCR for a single month. Computer orders in the first quarter rose 79%," Anderson said.

"Outside the U.S., incoming orders in March established a new record for that month," he noted.

"It is significant that, both economically and overseas, bookings for computer equipment led all other equipment categories in terms of percentage of objective. Orders for more than 500 Century systems of various types plus a large volume of add-on sales set a first-quarter record for incoming computer business," he continued.

Plans to Enlarge Share

Anderson indicated the firm plans to "significantly increase its share of the total DP market during the next several years with the addition of the Criterion systems and others to follow.

"Product development, manufacturing and marketing have been reorganized and streamlined to reflect our emphasis on providing complete computer systems," he said.

At the same time, revenue per employee has almost doubled, rising from $17,000 in 1972 to over $30,000 last year.

"Corporate profitability, meanwhile, has moved from a loss of $60 million in 1972 – after write-offs connected with our transition to electronics – to earnings of $72 million in 1975," he said.

Unbundling Seen OEM Solution

(Continued from Page 35)

In some questions, the responses from different sectors varied widely, reflecting their organizational strengths. For instance, large manufacturers valued regionally located service engineers at .4% while mini makers ranked this service 1% and system companies ranked it at 2.5%.

"The supplier must pause to reflect in his planning to consider the market he wishes to serve. If it is the systems house, then the service organization required is more than that for the other two markets," Schultz observed.

Although 71% rates salesmen's follow-up support at no value, suppliers should make certain – before adopting a "love them and leave them" attitude – their accounts are not among the 29% that do value postorder support, he commented.

Shultz's report recommended mini peripherals firms offer separately priced technical support for evaluations and systems integration as well as controller and systems design consultation.

Firms should also plan to implement local spare parts depots, promote this concept to prospects and offer a price discount for parts when long delivery times are acceptable, he said.

The cost of providing quick response from the factory to inquiries should be included in the price of the product, he advised.

The same pricing method should apply for salesmen, who should be instructed in their responsibilities for postsale efforts.

Finally, Schultz advised firms to investigate methods of changing the OEMs' perceptions to achieve consonance between the lowest price requirement and desire for additional services.

Southwest Show Set This Week

DALLAS – The Southwest Computer Show will be held here at the North Park Inn May 27 and will feature OEM and end-user products.

The show, featuring products of 25 exhibitors, is sponsored by Norm De Nardi Enterprises, which recently attracted 2,500 to its show in Palo Alto.

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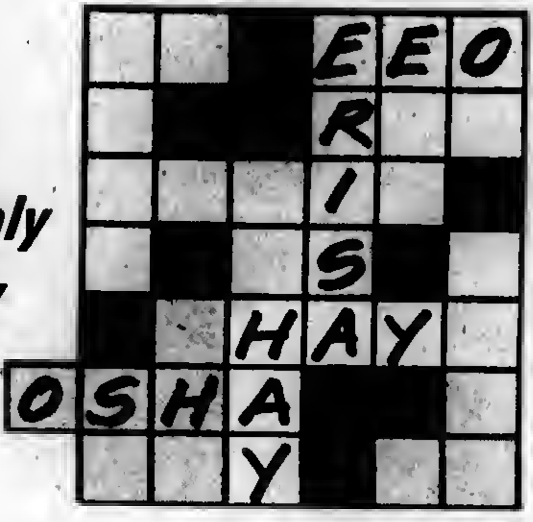

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Ann Arbor Credits Prices, Niche With Growth

By Molly Upton
Of the CW Staff

DETROIT – Price competitiveness and a niche in the marketplace have helped Ann Arbor Terminals, Inc. grow from a firm with an initial and sole capital of $15,000 in 1970 to a company that expects to do a little over $4 million in sales for the year ending in June, according to President Ed Zimmer.

Niches are nice to have in the market, but there are no clean ones, he said. The line is fuzzy because someone else can always "almost" do the same job, he said.

One needs a price advantage in order to get attention, he said. "Over time the niche becomes defined by virtue of your filling it," he added.

The firm makes CRTs and offers a variety of special features such as different character sets. Ann Arbor builds terminals in a modular fashion and tries to design them to facilitate the addition of special features, Zimmer explained.

"We try to anticipate what people want and build these capabilities into production," he said.

On the subject of surviving, Zimmer said "there's nothing magic about it. We want very much to do a good job for customers and to make a profit."

Ann Arbor has turned away business when both elements weren't there, he said.

Zimmer characterized his business approach as picking his shots rather than as a shotgun technique.

The firm employes 50 to 55 people and personnel hasn't grown much since sales reached $1.5 million, he said.

Ann Arbor offers factory service on its products with a two-week turnaround.

About 50% of sales are for some modification of terminals and 50% for standard products, he said.

Ann Arbor's products are not programmable, but do have several intelligent features built in, such as editing.

Zimmer has been looking at using microprocessors, "but so far the pricing isn't right for our use."

Zimmer said he doesn't see Ann Arbor offering user-programmable units.

Ann Arbor doesn't have a "razzle-dazzle" sales force, he said.

The rep scheme has been working well since "we found how to use them," he said. The secret to handling reps is to give them good support out of the factory, with consistency and dependability, he observed.

Technitrol Head Dies

BRYN MAWR, Pa. – E. Stuart Eichert, holder of a patent for disk and drum memories and chairman of Technitrol, Inc., died here recently.

Eichert was one of four founders of Technitrol in 1947 and received the patent for disk and drum memories in 1952.

Hogan Stresses Low Cost of LSI

(Continued from Page 35)

micros, he said.

"The capital required is too rich for their blood," he explained.

However, there is capital for bright young people with ideas based on micros who can get their product to market quickly, he said.

Micro in Every Home

"By 1980 there will be a microprocessor in every home and every car," Hogan predicted later at a press conference.

Fairchild is very excited about electronic games and the implications of thus placing a computer in every home, he said.

Initially, games will be installed and linked to TV sets. Children will become familiar with the interfaces and gradually the entire family will use the system for increased capabilities.

When asked whether he foresees other types of firms entering this area, Hogan remarked that when the semiconductor content of a product reaches 40%, "it's going to be very difficult for others to compete."

Fairchild's consumer market for microprocessors is probably a year ahead of the industrial sector, he remarked.

Although Fairchild was admittedly more excited about micros in the industrial sector a couple of years ago, it is now equally enthused about the consumer market, he said.

The industrial market decided to design much of the system itself and went into a lengthy design cycle.

The consumers, on the other hand, come to Fairchild and ask it to design the component, he said.

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The 440 will be part of a distributed processing network the firm is establishing.

Other Orders

E.F. MacDonald Sales Center has installed 25 NCR 280 retail terminals equipped with wand scanners, an NCR 747 color bar code printer and an NCR 725 minicomputer.

Fairview Hospital has installed a Univac 90/60 system to broaden its application and development of DP services in the medical field.

Cenex, a regional farm supply cooperative headquartered in St. Paul, Minn., has ordered four Univac 90/30 systems for on-line order entry and inventory control at its four distribution centers.

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source edp

East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).
Midwest: Chicago (312) 782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).
South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Forth Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).
West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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CIBER, Inc. (Consultants in Business/Engineering/Research) has a continuing need for qualified EDP professionals to support its growth. The individuals CIBER, Inc. are looking for are most probably currently employed. However, you may be missing the challenging assignments that increase professional expertise and produce both monetary and personal rewards.

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It does take time to respond to all resumes, so please be patient we will be calling you.

We offer excellent compensation with an above average health and insurance plan, which are only a small part of the total benefits of association with a growing consultant firm.

If you feel qualified and are desirous of furthering your EDP career through varied assignments while retaining employer continuity, we invite you to explore the possibility of employment with CIBER, Inc. by forwarding your resume to:

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If you have an advanced degree in Computer Science, Math or equivalent with 4 years' experience in Data Base Systems, we invite you to consider this immediate opening at our Palo Alto, California facility.

Areas of responsibility will include:

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If you would like to become associated with a leader and accelerate your career, please send resume with salary requirements/history to Professional Employment, Dept. RCL-14.

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No phone calls please. Send resume to Personnel Officer, Canal National Bank, Portland, Me. 04111.

PROGRAMMING

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For details plus additional growth situations contact Paul Torell, Vice-Pres. of Data Processing (201) 488-1910.

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Send resume and salary requirement to PERSONNEL DIRECTOR, Farm Family Insurance Companies, P.O. Box 656, Albany, New York 12201. *An Equal Opportunity Employer M/F.*

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Data Processing

SYSTEMS ANALYST

Northwest Computer Services, the DP subsidiary of Northwest Bancorporation, is looking for an experienced Systems Analyst at our location in Minneapolis. NCS is a large operation located in 6 states with its centralized computing facility in Minneapolis. We have a multiple 158/168 hardware configuration and a high degree of sophistication in banking systems. We feel we can offer exciting challenges for the right individual.

The proper candidate must possess experience in the design and analysis of on-line systems with a minimum of 3 years DP experience. Good communication skills are also required.

Helpful qualifications include experience in banking and financial applications, programming, and minicomputers.

This position offers a unique opportunity to participate in the design of advanced on-line services. Excellent salary and relocation package plus many company benefits. If you feel qualified for this growth position send a resume with salary history in confidence to:

Dale Hayden
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BANKING SYSTEMS

Management Consulting isn't your only career option. But it may be your best.

The management consulting field is just one area of application available to talented computer professionals. It is, however, one of the single most intellectually challenging and stimulating career options open to first-class minds.

As one of the leading general management consulting firms in the world, Booz, Allen & Hamilton can offer the rewards of a commitment to quality if your technical skills meet our requirements.

In helping management to translate business plans into information system strategies, our involvements cover areas such as evaluation of bank EDP departments, implementation of large complex systems, and general management studies. We currently seek candidates with the following background:

- 3-5 years hands-on experience in major commercial bank computer application, including DDA, savings, commercial and trust.
- Experience in EFTS planning or implementation desirable.
- Background in design and implementation of several major systems. Contact with user departments and appreciation of central computer operations important.
- Familiarity with bank office workflow and paper handling an asset.

This is a position involving travel and offers an attractive compensation package and benefits plan. You may respond with a resume, personal letter, or even a business card with your home phone number. Direct applicants with on-target experience should contact Mr. Allen Wurzbach, Booz, Allen & Hamilton Inc., Dept. CW-2, 245 Park Avenue, New York, N.Y. 10017. We are an equal opportunity employer m/f.

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Company offers compensation packages up to $30,000 & excellent benefits. All candidates referred to the client . . . will be evaluated by them for both their immediate sales needs & near term (18 months) management needs. For your convenience, you may either call MRS. KAYE at (212) 986-0100 for a private chat, or forward your resume to us. (Interviews by appointment only, please). Client company assumes all fees & relocation costs.

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Software Development Specialists

Our recent entry into the library automation field has created two new opportunities for experienced software specialists to participate in a project team effort for the development of automated systems products geared to the library marketplace. As a member of the project team, you will have direct responsibility for the full development of data storage/retrievel or teleprocessing software within a mini-computer environment.

These two positions require specific experience in data base development/management or telecommunications for on-line interactive applications using local and remote terminal equipment on a mini-computer. The ability to work in a self directed environment on long term objectives, previous experience in product development efforts, broad D.P. equipment/languages experience, and some exposure to mini-computer applications are essential. Exposure to PDP-11 series mini-computers is highly desirable.

Both positions offer immediate opportunity for involvement in the development effort for this new business activity. Each offers an attractive compensation package including company paid benefits and relocation assistance.

Brodart is a full line supplier of products and services to the library market throughout the U.S. and Canada.

Please forward a resume including salary history to:
Thomas E. Wozniak,
Selection & Placement Administrator

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COMPUTER DEVELOPMENT DIAGNOSTIC PROGRAMMERS

Fort Lauderdale, Florida

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Exciting career opportunities in state-of-the-art design have just opened in our Advanced Research and Development Department for diagnostic programmers with a potential career path into firmware design. These positions involve development of macro and micro level diagnostic and fault isolation tools for a wide variety of peripheral devices and microprocessors.

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Systems offers top starting salaries, relocation to beautiful Fort Lauderdale, Florida, a full-range benefits program and the opportunity to work and advance your career in a congenial and stimulating professional environment.

For immediate and confidential consideration, please forward resume or detailed letter of information, including current annual compensation, to Mr. Daniel Squires, Employment Manager, Dept. MH59, FN425, OS59,

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Many other openings in Wichita, Kansas City, Arkansas, & S.W. area. EDP SEARCH, 405-525-8833, 2401 NW 39 Okla. City, OK 73112.

Computer Programmers

The University of Scranton is seeking candidates with programming backgrounds to fill 3 positions with emphases in different areas: (1) Faculty support — requires familiarity with statistics and the use of statistical packages. (2) Administrative support — to write and maintain programs for in-house systems (3) Administration-oriented candidates with programming competence for the position of Assistant Registrar. Minimum requirements common to all positions are one year of experience and a bachelor's degree (preferably in Computer Science) with FORTRAN and COBOL programming. Plus factors are experience with documentation, structural programming, Xerox equipment and CP-V. Salary: $10,000 to $11,000. Send resumes to:

Personnel Services
University of Scranton
Scranton, PA 18510
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The United States
Coast Guard Academy
New London, Connecticut
Division of Academics,
Department of Computer Science

Has an opening for a teaching faculty position in Computer Science beginning Fall Term 1976. Involves teaching introductory and advanced Computer Science courses at the undergraduate level. PhD in Computer Science, Mathematical Sciences, or related field required. Academic rank commensurate with qualifications.

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Computing Center
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Systems Programmers—OS/HASP experience required. IMS, TSO support experience desired. Send resume including education, experience & salary history to:

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HEAD OF SYSTEMS PROGRAMMING

The FEDERAL RESERVE BANK of BOSTON is seeking an individual to supervise our systems programming staff. In this assignment you will report to the Manager of Systems and Programming. As supervisor your responsibilities will encompass both technical and administrative duties including:

- Administrative responsibilities for the systems programming staff.
- Planning systems programming activities.
- Technical support for in-house developed system software including a file management and a time-sharing system.

This position requires 3-5 years' systems programming experience coupled with proven project leadership experience. Qualified candidates must have at least three years' medium systems Burroughs experience.

To apply for this excellent career opportunity which pays in the low 20's, please send resume only to Mr. S.P. Heinrich, 30 Pearl St., Boston, Mass. 02106.

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IMS Project Manager
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To $19,000

All positions offer excellent growth, compensation, and benefits. Please send resume and salary history in strictest confidence to:

J. Peter Marshall Associates
Executive Search Consultants
1000 R.I.D.C. Plaza, Suite 311
Pittsburgh, PA 15238

Educational Systems Specialist

A computer professional to serve as liaison between the computing center and the faculty, and to serve as a consultant to the academic community. Desirable qualifications include two years educational/instructional/research computer applications; Master's Degree in Computer Science, Mathematics, Business, or related field. Salary range $13,418 to $17,663.

Apply to Frank Davis, Director of Computer Services, Bloomsburg State College, Bloomsburg, PA. 17815. Letters of application and resumes must be received by June 15, 1976.

Bloomsburg State College does not discriminate on the basis of race, color, creed, age, sex, or handicapped as required by Title IX and other legislation.

SOFTWARE PROGRAMMERS

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E-Systems is a leader in reconnaissance and intelligence gathering systems, electronics surveillance and other defense programs of a passive nature.

We're a high technology systems company with annual sales of over $200 million. We market products and services in more than 40 different countries. Our stock is listed on the New York Stock Exchange. You'll own some of that stock if you come with us.

We're looking for a few outstanding scientific programmers. People who can step into lead and associate positions to interface special purpose hardware with computers in real time state-of-the-art systems. Requires five to ten plus years experience in the production and test of product software for real time/near real time/process control or data base management applications utilizing large scale or mini-computers. Special emphasis will be placed on experience with IBM 370 assembly language under OS/MVT. Experience with the production of deliverable product software to support electronic systems in government procurements is highly desirable.

E-SYSTEMS
Garland Division
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If you qualify, send your resume, including salary history, to:
Mr. Tom J. Shepherd
E-Systems, Inc.
P.O. Box 6118
Dallas, Texas 75222

Programming

Analysts/ Programmers

International Division

Levis Strauss International is now engaged in major systems development project for its worldwide operation. The systems environment will be IBM System/3 using RPG II. Several programming and analysis positions exist for talented, professional team players who desire to participate in a multi-national organization. Positions based in San Francisco.

Basic positional requirements are:

1. Minimum of 2 years' recent heavy programming and analysis experience on System/3 and RPG II.
2. Ability and desire to travel extensively. Temporary (6-9 months) residence in Europe is absolutely required. Thereafter, approximately 20% travel internationally.
3. Degreed individuals with fluency in one or more languages (German, Italian, French, Spanish or a Scandinavian language) are preferred.

If interested, please forward your resume including salary requirements to Corporate Employment Manager, Personnel Department, Levi Strauss & Co., Two Embarcadero Center, San Francisco, Ca. 94106. We are proud to be an equal opportunity employer.

LEVI'S

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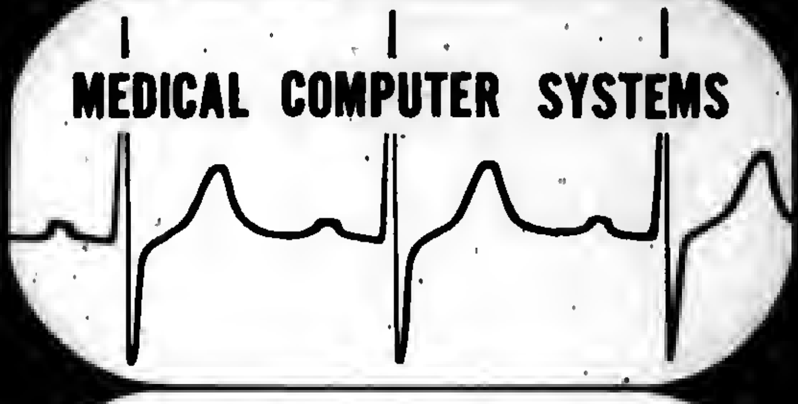

The automated health care industry is one of the fastest growing in the U.S. TELEMED Corporation is the world's largest processor of electrocardiograms (ECG's) by computer. We are a profitable, fast growing public company. We seek superior professionals with solid backgrounds in the following areas to fill immediate openings created by internal growth:

REALTIME SYSTEMS: Develop software for minicomputer based electrocardiogram analysis system. Previous applications background helpful but emphasis should be in system and realtime software. Timesharing link and 2 hands on Interdatas at your disposal.

GRAPHICS: Write software to display annotated medical data on graphics CRT, pen plotters, electrostatic printers, etc. Prefer individual who can evaluate hardware graphics devices.

OPERATING SYSTEMS: We have plans to upgrade 2 K110's to 2 KL10's with 256K of core within a year. We need someone who is interested in jobs such as performance analysis and/or modifications of TOPS10, installing CUSPS, and adding software for front and minicomputers of various manufacture.

MICRO SOFTWARE: We need a software giant who can work with design engineers. Control devices such as hammers, LED arrays, dot matrices, phone couplers, solenoids, etc. You will not be stuck with yesterdays products. Ability to handle the press of deadlines against evolving requirements is mandatory. Timesharing, cross assemblers, and 2 PL1 like languages available for microcomputer development.

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TELEMED provides a stimulating and challenging environment for highly qualified individuals. We have two Xerox Sigma S computers, two DEC K110 computers and 5 minicomputers of various manufacture. We have been described as the largest real time medical data processing facility in the world. We provide resources to maximize your efficiency and technical achievements through your own CRT for time-sharing or hands on minicomputer machine time. Our rapid growth creates advancement possibilities for the future. Please indicate areas of interest in reply:

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An administrative position in the computer controls area of material handling systems. Must have experience with both computer hardware and software products; systems analysis, design, development and installation of automated systems.

Individual must be highly self-motivated, comfortable with detail, capable of working with little supervision, ability to interface with and coordinate various departments, vendors and customer personnel. Responsible for both pre- and post-sales activities.

Degree in engineering, business or computer science plus a minimum of 6 years experience in computer systems and related fields (preferably both data processing and process control applications).

Experience in material handling and mini-computers systems, real time software and control electronics hardware are a plus.

Contact R.P. Dentner, Personnel Manager, Phone 1-215-252-7321, Ext. 282.

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JT **Jensen-Tracy Consultants**

Suite 1600, 711 Fifth Avenue
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Our client is an equal opportunity employer M F.

360/370 Systems

We are looking for applications programmers to support our needs for new commercial dp systems. Application areas include personnel, labor reporting, and budgeting. We are currently using TSO as a program development tool operation under OS/MVT. The following positions are currently available:

Programmer Analyst:

Experience in converting system specifications into programs. Ability to work with non-dp people to maintain and modify existing program systems.

Programmer:

Requires experience in coding, testing, and implementing computer programs according to defined specifications. COBOL experience required, BAL experience desirable.

Data Base Analyst:

The position requires that you provide data integrity for all IMS data bases, and create IMS control blocks. Debug IMS application program problems and IMS software problems. Analyze data and recommend action with respect to the use of IMS by various groups. Background must include training in file structures and design.

The above positions require a B.S. degree or equivalent experience. Benefits include liberal insurance and retirement programs, educational support and profit sharing plan.

Please send resumes to: Susan Telewski, TEKTRONIX, INC., P.O. Box C49, Beaverton, OR 97077.

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We currently have ideal career opportunities for "hands-on" doers who are performance oriented. Our large scale systems group, located in Marlboro, Mass. needs Systems Programmers to provide worldwide software maintenance and technical support. We also need several individuals to support our in-house marketing and development data centers.

You'll be providing support for DECsystem-10 and DECsystem-20 operating systems. You'll need 1 to 3 years of software background, plus experience in operating systems software. PDP-10 operating systems is an additional asset.

We want individuals who can assume problem solving assignments now for some of the largest and most sophisticated time sharing systems in the industry. These high visibility positions can provide a foundation for further growth in the areas of software development, software management or marketing.

If you're interested in professional growth, direct your resume to Julio Michaelson, Digital Equipment Corporation, 200 Forest Street, Marlboro, Massachusetts 01752.

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TERMINAL SYSTEMS DIVISION

Cambridge, Ohio

SYSTEMS ENGINEER

To plan and coordinate the development of systems software architecture for real-time microcomputer systems and the telecommunications software for both minicomputer and large scale computer systems. Perform analysis and systems design including hardware/software trade-offs with emphasis on software implementation. Will be coordinating with Marketing to determine customer needs and requirements relative to Point-of-Sale systems and telecommunications.

A degree and up to 5-8 years experience in real-time computer systems. Knowledge of high level languages – (FORTRAN, COBOL) etc., and of telecommunications disciplines – VTAM, BTAM, bisync, etc. Operating systems knowledge and experience desirable.

This is a strong systems position in the Supermarket P.O.S. group offering excellent growth.

SYSTEMS ENGINEER

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To develop an understanding of retail terminal equipment and systems. Will provide support for and investigate the application of data communication equipment and protocol procedures. Your assignments will range from telephone line communications (bi-sync, SDLC, async) to high-speed in-house communications schemes for retail terminal systems applications. An engineering degree and from 3-5 years experience in data communications equipment. Should possess a working knowledge of modems and adapters as well as communication protocol procedures in bi-sync, async, and SDLC type applications.

This work will impact significantly on the Point-of-Sale terminal effort for the general merchandising field and offers a fine professional work situation in our brand new engineering facility in east central Ohio.

We invite you to respond as soon as practical.

Robert W. Donovan
Terminal Systems Division – Cambridge
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OFFICIAL PUBLICATION

The Mid-Iowa Educational Computer Center will accept sealed bids until June 18, 1976 on the following equipment which will be sold to the highest responsible bidder.

2314 B01 IBM Direct Access Storage (Facility - Series B)

2319 B01 IBM Disk Storage - 3 drives

Bids must be submitted on a form of proposal furnished by the Center. Form may be obtained by writing the Director, Mid-Iowa Educational Computer Center, 2124 Grand Ave., Des Moines, Iowa 50312.

029
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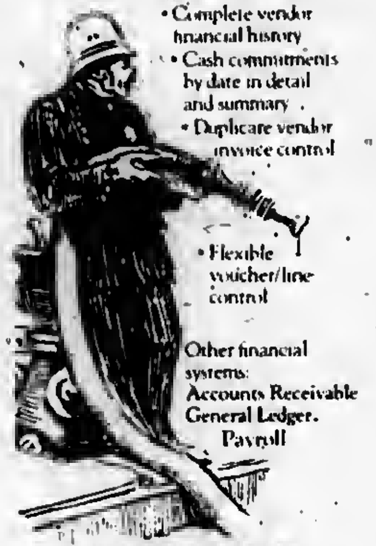

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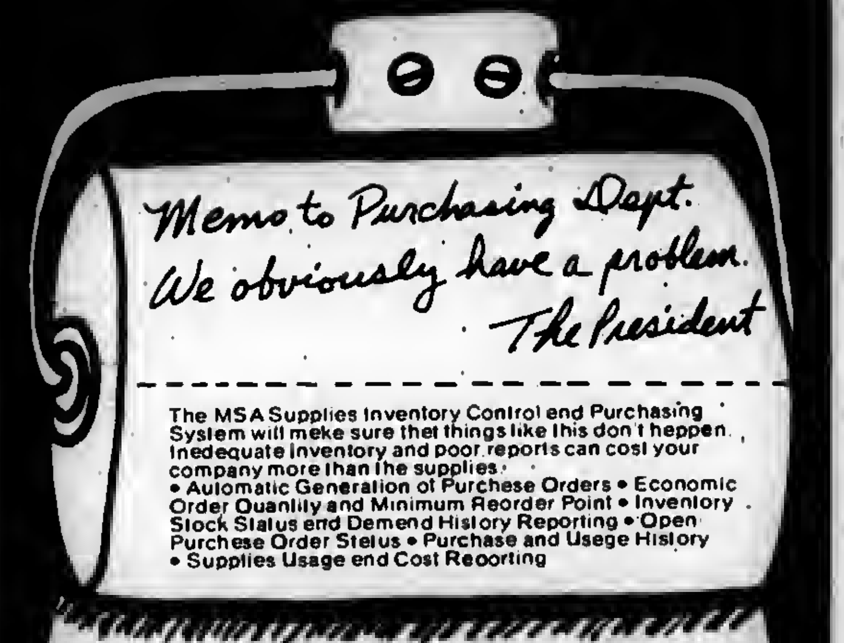

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Singer Presents Profitable First Quarter

By Molly Upton

Of the CW Staff

BOSTON – Devoid of its Business Machines Division, Singer Co. presented stockholders with a profitable first quarter.

"We have accomplished our primary objective of restoring the company to profitability," Chairman Joseph B. Flavin told stockholders at the firm's annual meeting here recently.

"We have had good indications up to this point that the worst is over, and we can expect a good, profitable 1976," he added.

Revenues rose to $553.1 million compared with $523.6 million in the first quarter last year. Earnings reached $15.6 million or 81 cents a share compared with a restated loss of $9.9 million or 64 cents a share in the year-ago period.

During the 1975 quarter, Singer incurred a loss of $9.5 million on foreign exchange adjustments compared with a loss of $1.4 million in 1976.

Flavin said the firm feels the $438.8 million reserves allocated for the disposal of the Business Machines Division and other operations is adequate.

He characterized 1975 as the year "in which we were forced to 'pay the piper,' so to speak, for a combination of problems and circumstances that demanded immediate and decisive action. . .Essentially we were drastically overextended financially."

The firm could not have continued to fund its business machines operations "without disastrous effect on our other operating areas," he said.

Flavin told reporters the point-of-sale (POS) business is a good business. There are opportunities for companies in it. "Unfortunately we were overextended and couldn't take advantage of it," he said.

Flavin said he thinks Singer will stay out of the DP field. The Cogar terminal business is up for sale, he added, indicating the first priority was to take care of the large base of customers in the POS and systems areas.

Flavin said he suspects that Singer and other diversified companies didn't last in the DP arena because it wasn't their principal business. "The computer field is one of the toughest. You've got to put your nose to the grindstone. It's got to be your main business," he told reporters.

In addition to divesting itself of the business machines operations, Singer sold its Water Resources and European Mail Order divisions and discontinued Tele-Signal products as well as Graphic Systems, which produced phototypesetting equipment.

Singer will continue to evaluate its operations, particularly those that are marginal performers, he said.

In sum, the firm closed or consolidated or made provisions to close or consolidate 13 facilities, he said.

Singer's employee count was reduced by 13,000 by the end of the year and has been reduced by an additional 4,000 since then.

The company has repaid $100 million of 8.25% debentures due April 15 using funds under the revolving credit line.

Total borrowings were down from $757.5 million at March 31, 1975 to $633.6 million for the first quarter of 1976, he said.

Flavin disclosed the firm has uncovered possible improper payments totaling under $10,000.

ADR First-Quarter Earnings Jump; Year Ended With Revenues Up 20%

PRINCETON, N.J. – Applied Data Research, Inc.'s (ADR) first-quarter earnings ballooned to $332,715 or 27 cents a share compared with $23,325 or 2 cents a share in the year-ago period ended March 31.

The earnings total was helped by a tax credit of $163,000 compared with a year-ago credit of $11,000. In the 1975 period there was also a $87,397 loss from discontinued operations.

Revenues for the quarter rose to $3.3 million from $3.2 million.

For the year ended Dec. 31, the software firm's revenues rose 20%.

With a charge of $411,469 applied to 1974 results to reflect the cumulative effect of a change in accounting on prior years, earnings rose to $431,736 or 36 cents a share compared with $49,281 or 4 cents a share the previous year.

However, earnings from continuing operations declined to $356,576 compared with $386,760 last year.

The 1975 results include a $17,949 gain on disposition of ADR's time-sharing division.

In 1975, the loss from discontinued operations was $149,789 compared with $197,010 last year.

Tally Chalks Up Records

KENT, Wash. – Tally Corp. scored record earnings and revenues for the first quarter ended March 28 as part of its turnaround.

Revenues grew to $6.1 million compared with $4.4 million a year ago, while earnings, aided by a $378,000 tax credit, rose to $658,000 or 19 cents a share.

This compared with $28,000 or 1 cent a share in the same period last year when there was a $35,000 tax credit.

The company incurred a $165,000 after-tax loss on foreign currency exchange, notably the lira and the pound.

President Leslie A. Larsen observed: "The results of the first quarter demonstrate that our turnaround has been effected and our efforts to produce higher profits are succeeding.

"Our marketing programs for our printers are meeting or exceeding anticipated goals, and we continue to believe that 1976 will be a highly successful year for Tally."

Larsen said the firm has reduced its level of borrowings, and the generation of working capital has been particularly pleasing over the past year.

Borrowings have been reduced from about $4.6 million at the end of 1975 to about $3 million currently, he said.

Backlog has risen to $8 million at the end of 1975 compared with $4 million at the end of 1974, he said.

Scan-Data Improves Net, Sales for Year

NORRISTOWN, Pa. – Scan-Data Corp.'s earnings and revenues improved for the year ended Dec. 31, with revenues rising to $11.3 million compared with $9.3 million last year.

Earnings totaled almost $134.4 million compared with $119.3 million last year. Tax credits were nearly equal, at $51,000 and $50,500 respectively for the maker of optical character recognition (OCR) and shared-processor key-entry systems.

Earnings Reports

RAPIDATA

Three Months Ended March 31

	1976	1975
Shr Ernd	$.15	$.19
Revenue	3,844,346	3,597,326
Earnings	277,849	349,836

SYCOR

Three Months Ended March 28

	1976	1975
Shr Ernd	$.42	$.44
Revenue	15,794,000	11,196,000
Tax Cred	.....	382,000
Earnings	1,238,000	1,217,000

WABASH MAGNETICS

Three Months Ended March 31

	1976	1975
Shr Ernd	$.33	$.14
Revenue	9,526,954	8,043,094
Earnings	550,642	230,653

DPF

Three Months Ended Feb. 29

	1976	e1975a
Shr Ernd	$.28	$.01
Revenue	6,400,000	6,038,000
Tax Cred	93,000	10,000
Earnings	1,145,000	25,000
9 Mo Shr	.38	1.13
Revenue	17,364,000	20,003,000
Spec Cred	b256,000	c4,379,000
Earnings	1,571,000	4,597,000

a-Restated. b-Consists of $128,000 gain on repurchase of debentures and $128,000 tax-loss carryforward. c-Consists of $2.21 million gain on repurchase of debentures and $2.17 million tax-loss carryforward.

HAZELTINE

Three Months Ended March 31

	1976	1975
Shr Ernd	$.40	.....
Revenue	21,120,000	$17,028,000
Tax Cred	280,000	.....
Earnings	780,000	(1,040,000)

INFORMATION MAGNETICS

Three Months Ended April 3

	a1976	1975
Shr Ernd	$.36	$.40
Revenue	8,170,000	5,624,000
Tax Cred	30,000	243,000
Earnings	465,000	506,000

a-For 14 weeks.

COMMUNICATIONS SATELLITE

Three Months Ended March 31

	1976	1975
Shr Ernd	$1.10	$1.27
Revenue	37,276,000	36,475,000
Earnings	11,041,000	12,692,000

MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg., Jackson, MS 39202, up until 2:00 p.m. 6-7-76 for the following data processing equipment:

Request for Proposal No. 244 for the purchase of a disk storage device to attach to an existing IBM 1130 computer system.

Request for Proposal No. 245 for the purchase of equipment to interface with an existing PDP 8/e computer system to allow analog to digital conversion, monitoring, and data collection and analysis from gas chromatograph, spectrophotometer, and x-ray diffraction instruments.

Request for Proposal No. 248 for the lease or purchase of a direct access storage device of the fixed storage medium type with a capacity of 317.5 mb per drive.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

INVITATION TO BID

Sealed Bids will be received in the Montgomery County Purchasing Office, Room 114, County Office Bldg., Rockville, MD 20850, until 2:00 p.m. on Friday, June 11, 1976, for third-party lease, lease purchase, installment plan purchase or straight purchase of computer hardware consisting of an IBM 370/145 J2 computer and associated peripheral equipment.

A Pre-Bid Conference will be held on Wednesday, May 26, 1976, at 10:00 a.m., in the 1st Floor Auditorium of the COB. Bid opening will be in Room 114 of the COB on Friday, June 11, 1976 at 2:00 p.m.

The Invitation to Bid will be available, after May 10, in Room 114. Bid Bond of $3,000 will be required.

For further information, contact the Montgomery County Purchasing Office – Mrs. M. Weaver, Purchasing Agent – 279-1466.

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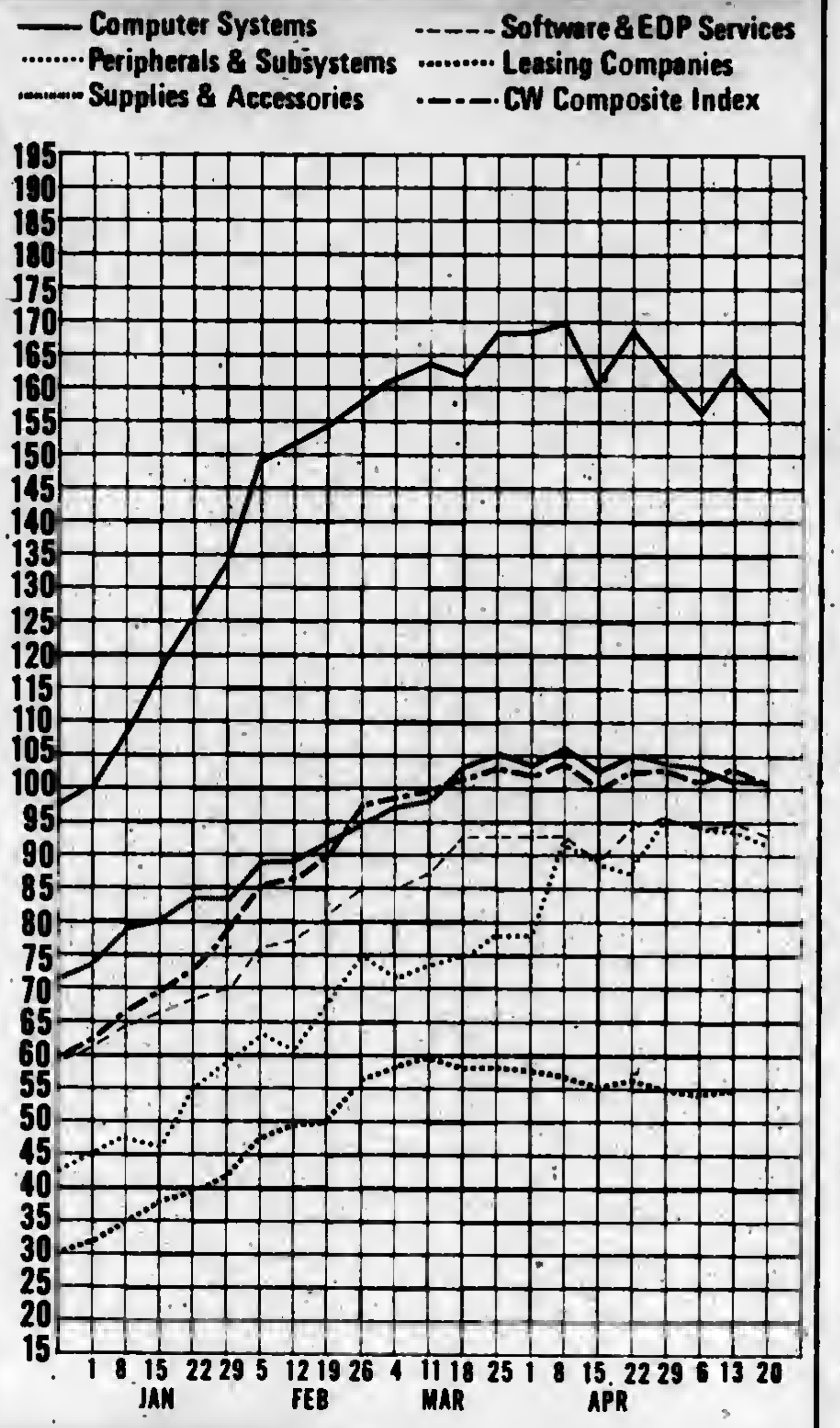
COMPUTERWORLD Computer Stock Trading Indexes



Earnings Reports

NATIONAL CSS
Year Ended Feb. 29

	1976	1975
Shr Ernd	$1.95	$1.67
Revenue	35,603,000	32,610,000
Earnings	2,161,000	1,829,000
3 Mo Shr	.54	.41
Revenue	9,314,000	7,905,000
Earnings	620,000	447,000

NASHUA
Three Months Ended April 2

	1976	1975
Shr Ernd	$.30	$.33
Revenue	81,998,000	74,279,000
Spec Cred	.....	a1,336,000
Earnings	1,400,000	1,541,000

a-Cumulative effect on prior years of accounting change.

NCR
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.54	$.84
Revenue	471,111,000	478,887,000
bSpec Cred	5,617,000	6,551,000
Earnings	13,224,000	20,848,000

a-Restated. b-Cumulative effect on accounting changes.

TRW
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.72	$.37
Revenue	722,500,000	608,800,000
Earnings	26,500,000	14,500,000

a-Restated to reflect accounting change for translation of foreign currency.

COMPUTER AUTOMATION
Three Months Ended March 28

	1976	1975
Shr Ernd	$.43	$.17
Revenue	7,967,455	5,359,606
Earnings	841,500	277,032
9 Mo Shr	1.14	.48
Revenue	22,331,977	15,610,790
Earnings	2,213,466	792,943

HARRIS
Three Months Ended March 31

	1976	1975
Shr Ernd	$1.10	$.72
Revenue	130,643,000	123,163,000
Earnings	6,937,000	4,518,000
9 Mo Shr	3.07	.....
Revenue	374,617,000	351,788,000
Disc Op	.....	(18,539,000)
Earnings	19,353,000	(3,972,000)

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 19, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 19 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-109	99 1/2	-2 7/8	-2.8
O	COMPUTER AUTOMATION	10- 19	15 1/2	-1 1/2	-8.8
N	CONTROL DATA CORP	18- 27	22 1/4	- 7/8	-3.7
N	DATA GENERAL CORP	40- 60	52 5/8	-2 7/8	-5.1
O	DATAPOINT CORP	24- 45	41 3/4	-3	-6.7
O	DIGITAL COMP CONTROL	2- 4	3 3/4	+ 1/8	+3.4
N	DIGITAL EQUIPMENT	138-181	163 1/2	-5 5/8	-3.3
N	ELECTRONIC ASSOC.	2- 5	3 1/8	0	0.0
A	ELECTRONIC ENGINEER.	7- 16	14 1/2	- 1/8	-0.8
N	FOXBORO	28- 47	41 1/4	+ 7/8	+2.1
O	GENERAL AUTOMATION	6- 11	9	- 3/4	-8.5
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	95-117	104 3/8	-6 5/8	-5.9
N	HONEYWELL INC	34- 56	45 1/4	-1 1/8	-2.4
N	IBM	227-272	253 3/4	-3 1/4	-1.2
O	MANAGEMENT ASSIST	1- 3	2	- 1/4	-11.1
O	MEMOREX	18- 23	20 3/4	- 1/2	-1.6
O	MICRODATA CORP	12- 26	20 1/4	-2	-8.9
O	MODULAR COMPUTER SYS	9- 13	10	0	0.0
N	NCR	24- 31	29	- 1/4	-0.8
O	PRIME COMPUTER INC	4- 11	9 1/4	- 1/4	-2.6
N	PERKIN-ELMER	19- 27	19 1/4	- 3/4	-3.7
N	RAYTHEON CO	45- 54	53	-1 3/8	-2.5
N	SPERRY RAND	40- 50	49 1/4	-1	-2.0
O	SYCOR INC	20- 31	24 3/4	-3 3/4	-13.1
A	SYSTEMS ENG. LABS	6- 10	9 1/4	- 1/2	-5.7
N	VARIAN ASSOCIATES	13- 17	14 5/8	- 5/8	-4.0
A	WANG LABS.	11- 20	12 5/8	- 7/8	-6.4

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 19 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	- 1/4	-3.2
A	COMMERCE GROUP CORP	2- 3	2 3/8	- 1/4	-9.5
A	COMPUTER INVSTRS GRP	1- 3	1 7/8	+ 1/8	+7.1
M	DATRONIC RENTAL	1- 1	3/4	0	0.0
A	DCL INC	1- 1	3/4	0	0.0
N	DPF INC	5- 7	5 5/8	0	0.0
O	EDP RESOURCES	1- 1	1	0	0.0
A	GREYHOUND COMPUTER	3- 9	7 3/8	- 1/8	-1.6
N	ITEL	6- 13	11 5/8	- 3/8	-3.1
N	LEASCO CORP	6- 14	11	- 5/8	-5.3
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	1- 1	3/4	0	0.0
A	PIONEER TEX CORP	6- 9	8	+ 1/8	+1.5
N	U.S. LEASING	7- 12	9 7/8	- 5/8	-5.9

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 19 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/4	- 1/4	-16.6
A	APPLIED DATA RES.	2- 3	2 7/8	0	0.0
N	AUTOMATIC DATA PROC	54- 67	65 1/2	+ 1/4	+0.3
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	3 5/8	0	0.0
O	COMPUTER DIMENSIONS	3- 7	5 1/2	- 1/4	-4.3
O	COMP ELECTION SYSTMS	5- 9	9	+ 1/4	+2.8
O	COMPUTER HORIZONS	1- 2	1 1/4	- 1/2	-28.5
O	COMPUTER NETWORK	2- 6	4 1/4	-1	-19.0
N	COMPUTER SCIENCES	4- 8	6 3/8	- 3/8	-5.5
O	COMPUTER TASK GROUP	1- 1	1 3/8	+ 3/8	+37.5
O	COMPUTER USAGE	3- 6	3	- 1/2	-14.2
O	COMSHARE	2- 7	5 1/2	- 1/4	-4.3
O	DATATAB	1- 1	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	12 3/4	- 3/8	-2.8
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1	- 1/8	-11.1
O	KEANE ASSOCIATES	2- 4	3 1/4	+ 1/4	+8.3
O	KEYDATA CORP.	3- 5	2 5/8	+ 1/8	+5.0
O	LOGICON	4- 4	3 3/4	- 1/8	-3.2
A	MANAGEMENT DATA	1- 3	2 1/2	0	0.0
A	NATIONAL CSS INC	13- 25	20	0	0.0
A	ON LINE SYSTEMS INC	18- 22	19 7/8	- 3/8	-1.8
N	PLANNING RESEARCH	3- 5	3 1/2	+ 1/4	+7.6
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	2 3/4	- 3/8	-12.0
O	REYNOLDS & REYNOLDS	13- 21	16 1/2	-1 1/2	-8.3
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	19- 23	25	-2	-7.4
A	UPS SYSTEMS	3- 5	3 3/4	0	0.0
N	WYLY CORP	3- 7	4	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 19 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 1/4	- 1/4	-2.6
O	ADVANCED MEMORY SYS	4- 10	7 7/8	- 5/8	-7.3
N	AMPEX CORP	5- 5	7 1/2	- 1/4	-3.2
O	ANDERSON JACOBSON	2- 4	2 7/8	- 1/8	-4.1
O	BEEHIVE MEDICAL ELEC	3- 6	5 3/4	+ 1/8	+2.2
A	BOLT,BERANEK & NEW	7- 10	8 1/4	0	0.0
N	BUNKER-RAMO	5- 7	5 7/8	0	0.0
A	CALCOMP	4- 7	4 1/2	- 1/4	-5.2
O	CAMBRIDGE MEMORIES	2- 6	3 1/4	- 3/8	-10.3
N	CENTRONICS DATA COMP	20- 36	30	-2	-6.2
O	CODEX CORP	22- 42	38 1/2	+2	+5.4
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	4 1/4	- 1/4	-5.5
O	COMPUTER CONSOLES	4- 7	7	+1 3/4	+33.3
A	COMPUTER EQUIPMENT	1- 3	1 7/8	- 1/8	-6.2
O	COMPUTER TRANSCEIVER	1- 3	1 1/8	- 1/8	-10.0
O	COMTEN	4- 9	8	0	0.0
N	CONRAC CORP	20- 25	22	-1 3/8	-5.8
O	DATA ACCESS SYSTEMS	1- 3	3 3/4	+ 1/2	+15.3
O	DATA 100	7- 13	10 1/4	- 3/4	-6.8
A	DATA PRODUCTS CORP	5- 11	9 1/2	- 3/8	-3.7
O	DATA TECHNOLOGY	1- 2	1 5/8	- 1/8	-7.1
O	DATUM INC	1- 2	1 5/8	- 3/8	-18.7
O	DECISION DATA COMPUT	2- 4	1 3/4	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/2	+ 1/8	+33.3
O	DI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 3/4	- 1/8	-4.3
O	FABRI-TEK	1- 1	1	+ 1/8	+14.2
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	10 1/2	+ 3/4	+7.6
N	HARRIS CORP	34- 47	46 1/4	+1 1/2	+3.3
A	INCOTERM CORP	7- 20	12	-2 1/4	-15.7
O	INFOREX INC	2- 7	5	- 3/8	-6.9
O	INFORMATION INTL INC	10- 18	15 3/4	+ 7/8	+5.8
O	INTEL CORP	69-109	70	-5	-6.6
A	LUNDY ELECTRONICS	4- 7	4 1/2	0	0.0
O	MSI DATA CORP	3- 7	6 3/8	- 1/4	-3.7
A	MILGO ELECTRONICS	15- 20	19 5/8	+1 7/8	+11.1
N	MOHAWK DATA SCI	3- 7	5 1/4	- 1/4	-4.5
O	OPTICAL SCANNING	1- 3	1/2	0	0.0
O	PENRIL CORP	1- 3	2 1/2	- 1/8	-4.7
A	PERTEC CORP	3- 8	5 5/8	- 3/8	-6.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	6	- 1/2	-7.6
O	QUANTOR CORP	4- 5	4 3/8	- 3/8	-7.9
O	RECOGNITION EQUIP	6- 11	9 3/8	- 3/4	-7.4
N	SANDERS ASSOCIATES	6- 11	9 7/8	- 3/4	-7.0
O	SCAN DATA	2- 4	2 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	12 3/8	0	0.0
O	T BAR INC	6- 10	6 3/4	0	0.0
O	TALLY CORP.	4- 6	5	+ 1/8	+2.5
O	TEC INC	3- 5	4 1/4	+ 1/4	+6.2
N	TEKTRONIX INC	45- 63	62 1/2	+2 1/2	+4.1
N	TELEX	2- 5	3 5/8	+ 1/4	+7.4
O	WANGCO INC	11- 22	16 1/8	- 1/8	-0.7
O	WILTEK INC	2- 2	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 19 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	2 3/4	0	0.0
O	BALTIMORE BUS FORMS	4- 5	4 1/4	0	0.0
A	BARRY WRIGHT	6- 10	8 1/8	+ 1/8	+1.5
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	33- 42	35 1/2	- 3/4	-2.0
O	DUPLEX PRODUCTS INC	17- 24	17 5/8	- 1/4	-1.3
N	ENNIS BUS. FORMS	6- 8	7	+ 1/4	+3.7
O	GRAHAM MAGNETICS	9- 13	10	+1	+11.1
O	GRAPHIC CONTROLS	13- 19	19	+ 1/2	+2.7
N	3M COMPANY	55- 65	57 3/8	-1 5/8	-2.7
O	MOORE CORP LTD	44- 51	45 1/2	-1 3/4	-3.7
N	NASHUA CORP	11- 17	16 1/8	- 3/4	-4.4
O	STANDARD REGISTER	16- 19	15 3/4	- 3/4	-4.5
O	TAB PRODUCTS CO	5- 8	7 1/2	+ 1/4	+3.4
N	VARCO	21- 25	22 5/8	0	0.0
O	VANIER GRAPHICS CORP	5- 8	6 1/2	0	0.0
A	WABASH MAGNETICS	5- 8	6 5/8	+ 1/4	+3.9
N	WALLACE BUS FORMS	19- 25	21 3/4	- 3/4	-3.3

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NEWSPAPER

NCC's 25th Far Cry From Its First

NEW YORK – The 25th anniversary edition of the computer community's annual get-together, opening here next week, will be a far cry from the first Joint Computer Conference which was held Dec. 10-12, 1951 at the Benjamin Franklin Hotel in Philadelphia.

More than 35,000 are expected to attend this year's silver anniversary event compared with the 877 who met at the inaugural meeting to discuss the 10 major computer systems then in existence.

Furthermore, more than 300 exhibitors will be displaying their wares in 943 booths this year; there were no exhibitors at the first meeting and only 20 at the second Joint Computer Conference in 1952.

In addition, this year's National Computer Conference (NCC) – the successor to the previous semiannual "Joints" – will feature more than 140 separate sessions with approximately 500 individual presentations and papers, compared with the 18 papers presented at the first meeting back in 1951.

The purpose of that first meeting was to discuss and compare the characteristics and performance of the 10 then-working large-scale electronic digital computers. The meeting came just nine months after the first commercially produced digital computer – the Univac I – had been accepted by the Bureau of the Census; the first installation of a computer by a business firm was still three years in the future.

This is CW's NCC preview issue. A listing of products on display begins on Page 33; a complete schedule is on pages 42 and 43.

Today there are more than 324,000 computers installed with about 122,000 in the general-purpose category and 202,000 in the dedicated-application or minicomputer category, according to International Data Corp., an industry research firm.

The hot topics at the 1951 meeting included the use of such storage devices as mercury relay lines, magnetic drums and cathode ray tubes. Other

(Continued on Page 7)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper   Second-class postage paid at Boston, Mass., and additional mailing offices
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Price: $15/year   May 31, 1976   Vol. X, No. 22

Users Get Four More Options From HP, CDC

•HP 3000 II Has Faster CPU

By Esther Surden
Of the CW Staff

NEW YORK – The HP 3000 Series II introduced here last week by the Hewlett-Packard Co. (HP) features a faster CPU, faster memory and an enhanced operating system which combine to provide "two to six times the throughput" of its HP 3000 predecessor, according to the firm.

The Series II, with three configurations that range in size from "supermini" to "small general-purpose systems," is software-compatible with the HP 3000, a spokesman said.

The HP 3000's name, basic system architecture and I/O structure have been retained along with its data base, multilingual, multiprogramming and virtual memory capabilities, he noted.

Users of HP 3000 systems can field-upgrade to the Series II's 256K version for $75,000 with an upgrade equipment package, he added. Downtime for the upgrade would be about two days, he said.

The Series II Model 5 is comparable to the Digital Equipment Corp. PDP-11/70 and was designed for sophisticated end users and OEM systems houses, according to the spokesman. The system is meant for use in commercial DP environments as either a stand-alone or as a satellite in distributed processing nets, he said.

The Model 7 "small business system" was designed for users of the IBM 3/10 as an alternative to upgrading to the 3/15 or the low end of the IBM 370 range. It supports both on-line and batch operations, as does the Model 5.

The Model 9, the top of the line introduced, is a general-purpose computer

(Continued on Page 2)

•CDC Cyber 71 Shares Power

By E. Drake Lundell Jr.
Of the CW Staff

MINNEAPOLIS – Sharing the computing power without distributing the computers is the key to the Cyber 70 Model 71 announced last week by Control Data Corp. here.

The medium-scale or "entry-level, large-scale system" follows the CDC tradition – begun more than 10 years ago with the CDC 6600 system – of distributing the processing of system information among central processing and peripheral processing units.

In its most basic configuration, the Cyber 71 has one central CPU and 10 peripheral processors, but this can be increased to two central processors sharing main memory and 20 peripheral processors.

The central unit and all the peripheral processors have to be located at one central site, the firm said, adding the maximum configuration could support up to 500 remote terminals.

(Continued on Page 3)

Consultant Concurs With Jung: SSA DP 'Wasting Millions'

By Edith Holmes
Of the CW Staff

SANDY SPRING, Md. – The Social Security Administration (SSA) is doing unit record processing on third-generation equipment, according to an independent consultant who has done some work for the federal agency.

Commenting on criticisms of the administration by Ferdinand Jung, a programmer employed by SSA [CW, March 29], William Gorman said he agreed with Jung that SSA "is wasting tens of millions of dollars" and that the proposed $69 million computer center building is – at least technically – unnecessary.

But Gorman added that he believes members of SSA Commissioner James Cardwell's staff and the commissioner himself are just as right in stating the agency cannot risk interruption of its operations which result in benefit payments to millions of people.

Issuing its 34 million benefit checks to U.S. citizens each month is "SSA's religion," the consultant said. The justification for this approach to beneficiary accounting is that the system, the basic

(Continued on Page 3)

Procedural Error Foils Scheme That Bilked BC/BS of $128,000

By Catherine Arnst
Of the CW Staff

KANSAS CITY, Mo. – An almost foolproof scheme that bilked Blue Cross-Blue Shield (BC/BS) here out of approximately $128,000 over a two-year period was tripped up only because a procedural error was made on a computer entry form that contained fraudulent information.

Carolyn Johnson, a BC/BS employee for six years and the engineer of the scheme, pleaded guilty recently to charges of using fraudulent medical claims to obtain money from the firm for herself and 22 cohorts, all nonemployees of BC/BS.

The plan worked because the forms contained legitimate names and policy numbers of BC/BS customers, usually friends or relatives of Johnson.

Johnson, a claims examiner, filled out the forms with real policy numbers, false claims and a code directing the check covering the claim to be mailed to the claimants rather than the providers of the medical services (such as doctors or hospitals).

The claims forms were passed through a supervisor to a keypunch operator, where checks were made to ascertain that the person was insured by Blue Cross. Once cleared, the data was input into the BC/BS' IBM 370/158.

The program used to process claims "only checks for errors and not for fraud, so the claim would always be cleared," according to William Welch, the county prosecutor who handled the case.

(Continued on Page 2)

AT&T Reports No Lobbying Funds

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Despite an intensive Bell System effort to get both Washington legislators and its stockholders to support the Consumer Communications Reform Act, AT&T spent no reportable funds on official lobbying functions during the first quarter of 1976.

Lobbying expenditures for the first three months were published recently in the *Congressional Record* and, for the second consecutive quarter, AT&T reported its registered lobbyist, vice-president of AT&T's Washington office, John G. Fox, spent no money at all that must be reported under the 1946 Federal Regulation of Lobbying Act.

One senator who feels the lobbying requirements are too lenient is Lee Metcalf, (D-Mont.), who recently told the Senate the 1946 act is "distinguished primarily by its hot and cold running loopholes for anyone who wants to wash his hands of public disclosure."

Metcalf has sponsored tougher lobby-

(Continued on Pa

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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9: Telex: 264737. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy: $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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HP Series Adds Faster Memory

(Continued from Page 1)

comparable to the Decsystem-20 and the lower end of the IBM 370 range, the spokesman said, and was designed for larger commercial or scientific users.

The faster microprogrammed CPU on the Series II incorporates a microprocessor based on a 32-bit biploar read-only memory (ROM). The micro, with a 175 nsec cycle time, contains 209 firmware instructions to control CPU and I/O functions, HP said.

The 18-pin 4K random-access memory (RAM) chips used in the Series II semiconductor memory are said to be 33% faster than the 3000's previous core memory. Memory read/write cycle time is 700 nsec, and maximum main memory is now 512K bytes, four times that available previously, the spokesman said.

The memory reportedly has the ability to detect and correct single-bit errors. Five checking bits determine when a single-bit error occurs in any 16-bit word and pinpoint the failing bit.

The Multiprogramming Executive II (MPE II) disk-based operating system introduced for the Series II supports five programming languages: Cobol, RPG-II, Fortran, Basic and HP's Systems Programming Language (SPL), the firm said.

With MPE II, HP 3000 object programs being executed are separated into permanent program instructions (code) and program temporary values (data), each occupying a separate group of memory locations; the code can therefore be shared among multiple users, it said.

The operating system also supports virtual memory for large program execution, HP said. Only 8% of the operating system resides in main memory at any one time, the spokesman added.

A basic Model 5 includes a 128K-byte fault control memory expandable to 256K; a 15M-byte moving head disk; 1,600 bit/in. magnetic tape drive; and a CRT system console.

The Model 5 can accommodate up to 31 terminals and the user can select up to four line printers, eight 47M-byte disks, three more 15M-byte disks and card equipment, HP said.

Software included is the MPE II, an on-line editor, utility programs and SPL. The basic system cost is $110,000, the firm said.

The Model 7 replaces the 15M-byte disks on the Model 5 with two 47M-byte disks. The Model 7 can include six additional disks, 31 terminals, four line printers and card units.

Included in the basic Model 7 price of $150,000 is the software for the Model 5 plus Cobol, RPG-II, and HP's Image data base management software.

The Model 9 has a minimum main memory of 320K bytes expandable to 512K. Standard hardware is the same as that of Model 7; the configuration can be expanded to include seven additional tape drives, four line printers, 340M bytes of additional tape drives, four line printers, 340M bytes of additional disk capacity, card equipment and a maximum of 63 terminals.

The Model 9 comes with all five languages and the Image software and costs $190,000.

Full-payout lease plans are available.

An IBM 2780/3880 emulator for remote job entry is optional on all Series II models, the firm said.

HP is at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Amdahl Reacts to IBM Price Cuts

SUNNYVALE, Calif. – Reacting swiftly to IBM's memory price reductions [CW, May 24], Amdahl Corp. here slashed its memory prices for the 470V/6 by up to 38%, the firm said last week.

However, CPU prices were raised on the system, giving a net effect on system prices of a 5% average reduction with higher reductions on systems with larger memory and retaining the differential between the Amdahl prices and IBM's.

Under the new prices, users with a 1M-byte system would pay more – $3.85 million compared with $3.75 million before. The CPU increases and memory decreases balance out on a 2M-byte system with the old price of $4.05 million reduced slightly to $4.03 million.

The largest reductions come in the larger memory sizes with an 8M-byte system reduced from $6 million to $5.235 million.

Error Foils BC/BS Bilk Scheme

(Continued from Page 1)

"As long as the claims are prepared with good data, it is a beautiful setup," Del Sharp, vice-president of computer services at Blue Cross, agreed.

What finally destroyed this "beautiful setup" was a procedural error. One of the persons involved in the scheme who did not work for BC/BS knew how the process operated and filled out her own form, rather than letting Johnson do it.

She made an error, however, and the claim was rejected when the data was input.

That claim, which was for $1,200, went to a quality control supervisor who called the doctor listed as the provider and learned the operation had never been done. An audit was then done of all claims that had been paid to BC/BS members; the fraudulent ones were traced back to Johnson and 23 indictments were handed down last October.

The perpetrators of the fraud would have been caught even if an error had not been made, Welch said, noting there is a certain limit to the size of a claim that can be input directly into the computer without a supervisor's approval.

"Somebody would have finally broken down and tried to go over the limit," he said.

BC/BS has added several safeguards to ensure this type of fraud does not recur, such as software and hardware traps and some internal policy changes, Sharp said.

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Cyber 71 Shares Central, Peripheral Processor Power

(Continued from Page 1)

Each of the central processors in the Cyber 71 system features 25 operating registers divided between operand, address and index functions, with memory protection and error checking supported by additional registers.

The system runs under the CDC Network Operating System (NOS) and Network Operating System/Batch Environment (NOS/BE), previously available with the firm's Cyber 170 line.

In the CPUs, instructions are handled on a register-to-register basis, resulting in an instruction rate of 1.2M instruction/sec with a single-processor configuration or 2M instruction/sec in a dual-processor configuration.

Main memory for the system is either 65K, 98K or 131K (60-bit) words whether the unit is a single- or dual-processor configuration, since the memory is shared between the two in the dual processor, the vendor said.

The memory is organized in logically independent 4K-word banks which are overlapped and phased, according to CDC. In addition, extended memory ranging from 250K words up to 2M words is available. This memory is also shared in the dual configuration.

While actual data transfer rates depend on the number of memory banks used and the speed of the equipment connected to the system, the optimum rate is up to 10M word/sec with block transfers between main memory and extended memory units, CDC said.

The system can handle a total of 20 peripheral processors which are independent and programmable, CDC said. Each of these units includes 4K words of memory, 63 instructions and three registers, the firm added.

All of the peripheral processors use an identical instruction set and operate with a 1 μsec cycle time. They interface to system peripheral equipment and the central memory through a group of 12 to 24 bidirectional I/O channels, CDC said.

The number of I/O channels on the system increases in relation to the number of peripheral processors. A system with 10 peripheral processors would have 12 channels, a unit with 14 peripheral processors would have 18, one with 17 processors would get 21 channels and a full system with 20 peripheral processors would have the full 24 channels.

Each peripheral processor has access to the full set of I/O channels on the system for communications either with the central memory or the peripherals attached to the system.

The peripheral processors perform data formatting, address calculations, directory and pointer processing, character comparisons and conversions, CDC said.

A configuration capable of supporting up to 256 teletypewriter-compatible terminals would have two central processors and 14 peripheral processors.

Peripherals on such a system would include eight spindles of 844-21 disk storage for a total of 944M characters; two 7054 disk controllers, six 657-2 tape drives, one 3518 tape controller, a card reader and controller, a line printer and controller and four multiplexers.

The purchase price for that configuration would be $1,117,500 and the lease price would be $24,240/mo on a three-year contract for the hardware alone.

The system software for such a configuration would be an additional $6,000/mo or could be purchased for $225,000, the firm added. Deliveries will begin in July.

Consultant Agrees With Jung on SSA

(Continued from Page 1)

processing, works, he noted.

Gorman had access to the internal environs of the four-acre computer room at the agency's offices in Woodlawn, Md., for a period of months. He was not there to do performance evaluations of the SSA's DP operation, but to find and correct specific problems and to implement some outside software.

Yet, having been there at all hours of the night and day and on weekends and holidays as well, his observations led him to believe there are a number of procedures that could be instituted to bring the agency's data processing into the 20th century.

First and foremost, he suggested selective use of SSA's files. The agency presently uses its entire master file for every run, even though there are a comparatively small number of transactions to be processed from that file.

The hit ratio of transactions to the overall file is 1/100 of 1%, Gorman said. Yet every time the master file, containing some 28 million accounts by Social Security numbers (SSN), is updated, all accounts are updated even if they have seen no activity.

Gorman wondered whether the agency's daily processing might be done against a subset of its huge master file. The "daily" master file would contain only the more active SSNs, he said. The entire master file could be updated on a monthly basis.

SSA personnel attend seminars on large-scale data base management and mass-storage techniques, he said. But this technology and its possibilities never seem to make it back to actually impact the DP operation at the agency.

Scheduling of machine time represents another area where the administration could save money through utilizing its hardware better, the consultant commented. "At some hours, there is precious little running of equipment at all; at other times, the machines are overworked," he said.

Capacity is probably where it should be during the regular business day shift, Gorman added. It's the second and third shifts and the weekends that see very little CPU activity.

Gorman also suggested SSA is assuming risks of great proportion by putting all of the agency's processing essentially under one roof.

"Distributed processing is probably a concept unknown to SSA's commissioner and his staff. They cannot be expected to know the DP business, so they must take the advice of their senior technical management," he said. "That management wanted a comfortable, modern edifice to house its systems.

"The very nature of those systems is the reason the commissioner and his staff must go along with those plans and why Jung and others like him were unable to change things," Gorman continued.

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Checkout Time Reduced 26.5%

Scanning's Greatest Savings Found in Front-End Labor

By Catherine Arnst
Of the CW Staff

SAVERNA PARK, Md. – The greatest savings for a supermarket using a computerized scanning system would come from the reduction of front-end labor, a recent study conducted by Giant Supermarkets found.

The reduction of front-end labor would result in a savings of 42% of the total savings per month available to a store using scanning, Giant said.

Removal of prices in favor of the Universal Product Code (UPC) label would constitute another 23% of the savings, it added.

The figures were derived from observations made in two of Giant's stores with scanning equipment; one store used only the UPC label as a price indicator.

Giant's intent was to determine the effect of scanning on a store whose gross sales volume is $140,000 per week.

The estimated savings available to such a store would be $12,055, Giant concluded.

The "effective hourly wage" used to calculate savings (the wage per hour plus overtime, vacations and other fringe benefits) was $8,175 for checkers and $8.538 for grocery clerks.

Checkout Time Reduced

The front-end labor savings that could evolve from a scanning system is the "reduction of the total time to check out a customer, which consists of the ring-up, cash transaction handling and bagging times," the study said.

The amount of time it would take to process an order in a store could be reduced by 26.5% if a computer-assisted scanning method were used, Giant calculated.

To determine how much employee time was used in the front-end process, the company monitored the number of hours per week spent checking and bagging.

> *'The reduction of front-end labor would result in a savings of 42% of the total savings per month available to a store using scanning.'*

It came up with 459 hours per week spent checking for all employees, 27.5 hours per week bagging and 3.5 hours per week helping another checker bag – in the $140,000/week store.

To calculate the savings a scanning system would offer, Giant assumed bagging assistance could be eliminated, multiplied the time spent checking by .265 and multiplied the result by the effective hourly wage. The resulting figure was $5,112 in savings per month.

Easier to Achieve Savings

The price marking savings a scanning system would provide a store were assumed to be much easier to achieve than those savings which require "the implementation of special disciplines and management attention such as with front-end productivity. Simply put, nothing has to be done to obtain the entire benefit," Giant said.

The chain found it takes an average of 15.5 seconds, or .0043 hours, to price mark a single case of merchandise, and the average number of cases marked during a month is 38,640.

It also found it takes an average of 10 seconds, or .0028 hours, to re-mark a single item; the number of items re-marked per month averaged out to 40,247. Management also spends approximately 10 hour/week reviewing prices.

If these chores were eliminated, the result would be a savings of $2,745 per month, the study claimed. This sum equals 23% of the total savings to a store per month.

Computer-assisted checkout systems eliminate the time spent balancing cash registers and preparing a cash report required by a manual system, the study reported.

The hours saved in performing this function would be 50 per week, which translates into a cash savings of $1,770 per month for the store.

Giant does not use the scanning system's potential capability to log all items as they are sold, claiming it is "one of those areas which implies new disciplines and management attention," as well as the development of a new host computer.

Ordering System Savings

It did, however, estimate the potential savings to a store that an automatic routine ordering system could offer by determining how many hours are now spent ordering manually.

The study concluded that a store could save 31 man-hours per week, or $1,146 per month, by using a computerized ordering system.

The amount a store could save by eliminating under-rings was also estimated in Giant's study. It assumed that "most food retailers believe they are losing money due to under misrings at the checkout. When errors occur, they are more often in favor of the customer than the store."

The only study done in this area was in 1963, when Edward Harwell estimated that supermarkets were losing about .7% of sales due to under-rings. "This number is very large, considering the industry currently earns only about .83% after taxes," according to Giant.

The chain claimed to have reduced the amount of under-rings in its stores by .2% of gross sales, although no study has been done. Giant also estimated that a scanning system would further eliminate 75% of the total under-ring loss. If so, the estimated savings per store would be $909 per month.

Approximately 3% of the savings per month available to a store would be obtained through the elimination of costs involved in replacing mechanical registers, which have an average depreciation life of 120 months, the study claimed. In a store with 12 registers, this savings would equal $373 per month.

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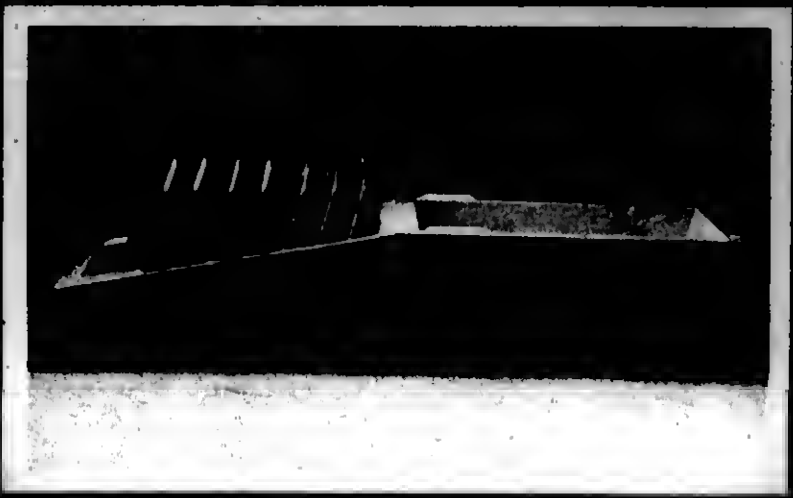

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Supermarkets Say Laws Unneeded

Open Market Should Decide on Item Price Marking

By Catherine Arnst
Of the CW Staff

An open market rather than legislation should determine whether prices should be removed from individual items in supermarkets with scanning systems, supermarkets in a recent *Computerworld* survey agreed:

Legislation is needless, the supermarkets said, reacting to a study by the Ad Hoc Committee on the Universal Product Code (UPC) which concluded that consumers would not shop at stores that discontinued price marking [CW, April 5].

Of the supermarket chains contacted, five have scanning systems. Only one, Marsh Supermarket in Troy, Ohio, intends to continue leaving off individual prices. Giant Supermarket in Maryland is replacing prices now; two chains are required by state law to leave prices on; and one store never intended to remove prices.

Leaving prices on may please the consumer, but most of the supermarkets surveyed agreed it has discouraged the food industry from adopting scanning systems.

"Price removal is a very attractive incentive" for the supermarket to install a system, Ron Cantrell of Ralph's Supermarkets in California said. Ralph's installed its first scanning system in September 1974 and added four more stores to the system in the past two weeks.

The stores are required to mark prices by a California law that went into effect April 1. Prior to that date, Ralph's left prices off in its first scanning store for "four or five months as an experiment," Cantrell said.

No Customer Reaction

"There was no reaction by our customers. We had built up enough faith in the system so that customers didn't mind. We asked for their comments and got none," he said.

His observation contradicted the Ad Hoc study, which indicated that customers do mind. "The Ad Hoc study was directly addressed to price consciousness," Cantrell said. "We didn't try to measure that."

Cantrell is disappointed that the committee took a stand requiring price marking. "The scanning system is not designed to have the prices left one," he said.

"The person marking the item is going to make mistakes; 99.9% of the time the computer will record the price correctly. The customer will lose confidence in the system if he sees the scanner record a price at the point of sale that is different than that marked on the product.

"We already experienced that problem, particularly during start-up," he said. "And the errors will continue."

"The consumers should make the choice of whether they want to shop at a store with or without prices marked," Cantrell said in reaction to the California law which required his store to put the prices back on.

The Ad Hoc Committee's study found consumers would make the choice, and that choice would be not to shop at a store using only UPC labels as price indicators.

Marsh Supermarket said the study was accurate, but only as a human behavioral study. "It should be measured along with a consumer attitude study," Clyde Dawson, director of research at Marsh, said.

"If you ask customers flat out if they want pricing left on, they will say yes," he said; in surveys done by the store 64% of the customers answered this way. "But if they are told price savings would be had if prices are removed, they are agreeable as long as we keep good shelf pricing," he said.

Marsh, which was the first store to install a scanning system in June 1974, has not lowered prices because of the scanning system, Dawson said. "But we have raised the level of service," he added.

The store is still testing its system, and no decision has been made on whether to leave prices on or off, Dawson said. And although price removal "does offer benefits to the store, it is not the only benefit" to be derived from a scanning system, he said.

"I have to believe customers will profit from scanning. Traditionally, in the grocery industry, any savings that are made by the store through new developments are passed on to the customer through lower prices. Now, supermarkets are operating at a lower level of profit than ever before," Dawson said.

Improved Service

Logli Supermarket in Rockford, Ill., installed its scanning system on one of its three stores in September 1975 and "never had any intention of removing prices," Aleck Johnson, vice-president of the chain, said. "We went into scanning with the idea of improving service and that's what we have done," he said.

There have been no savings to the store since installation because marking all the products with UPC labels has increased costs as has the programming time used every day to update prices in the computer, Johnson said.

The system was worth installing because it has speeded up checkout service, is more accurate and improves customer confidence in the store, Johnson said.

"The customers love it and the consumer groups hate it," he said. "Our sales have continued to increase since installation."

Supermarkets that have scanning systems and continue to mark prices have had almost no feedback, negative or positive, on the new checkout system, according to the CW survey.

First National Stores (Finast) of Massachusetts found the same lack of opposition to its system as Logli's, according to Bob Nolan of that store.

The chain has two stores with scanning systems. The first changed over in February 1975 and the second was installed last August.

When the first system was installed, 30,000 opinion forms were handed out the first two weeks of operation. Nine responses were returned and seven of those were favorable, Nolan said.

Although Finast is required by Massachusetts law to leave prices on, it would like to conduct tests with them off, Nolan said. The Ad Hoc committee's statement will delay the acceptance of scanning systems that much longer because it denies the stores the chance to make tests determing whether price marking is or is not beneficial, he added.

Full Potential Unused

Finast has not yet determined how effective its systems are, Dawson said. Because of item pricing the system cannot be used to its full potential in the area of inventory control, he said.

"Our policy is for the checker to scan the product at least twice. If it doesn't record, he rings in the price manually. This happens quite a bit," Nolan said.

"That's where the data falls down. There is no way of knowing how accurate the information in the computer is; only those items whose prices were scanned are recorded."

Giant has been fighting legislation requiring that prices be marked in Maryland because it wants the opportunity to conduct testing. It left prices off in one of its six stores with scanning systems to determine the effects.

Although its study found that "substantial savings could be realized that could be shared with consumers (see story on Page 4), according to company President Joseph Danzansky, Giant had committed itself to complying with the position taken by the Ad Hoc Committee and so is replacing the prices in that store now.

In return, the Maryland legislature killed a proposed bill to require price marking.

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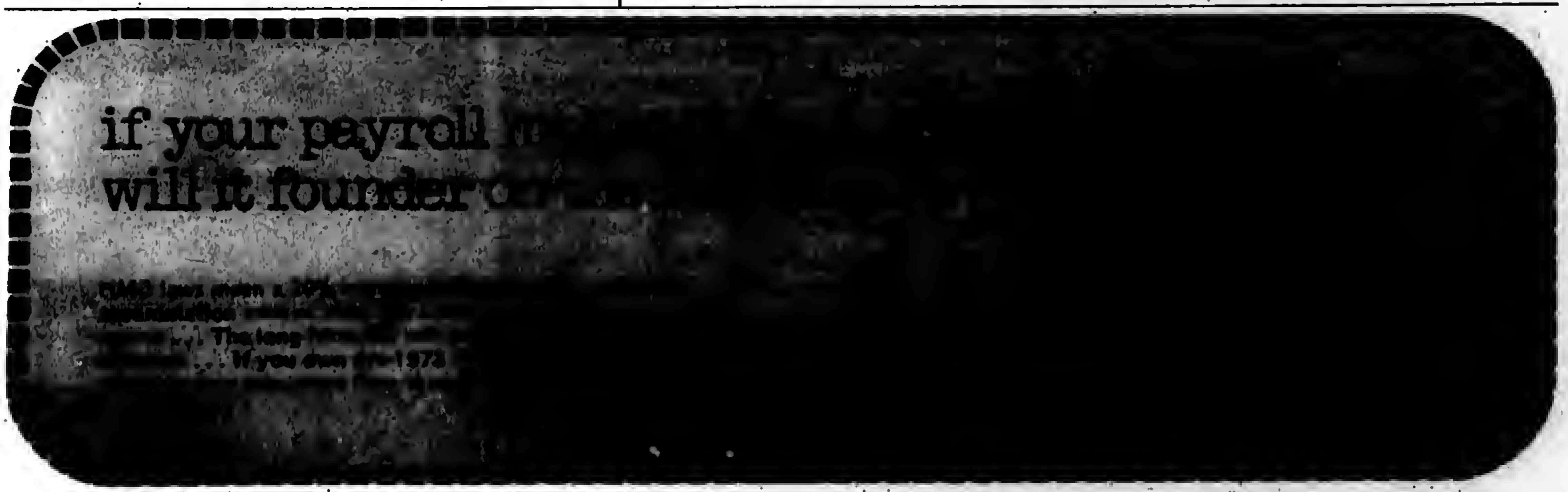

AT&T Reports No Lobbying Funds

(Continued from Page 1)

ing rules in the proposed Lobbying Disclosure Act of 1976 (S.2477) which could come up for a floor vote in June, according to a member of the senator's staff.

The senator also has called attention to other ways that large corporations can exert their influence on congressmen and others. One of these is membership on little-known federal advisory committees.

AT&T held more memberships on these committees than any other company with the exception of RCA as of the third quarter of 1974. The Bell System had representatives on 95 of the advisory committees; another listing for the same period showed total AT&T representation at 119 persons.

Admittedly, some of these advisory committees are very specialized in nature and it is unlikely Bell could use them to further political aims. But others are closely tied to regulatory issues that relate to the Federal Communications Commission (FCC) and current legislation.

"What better way could there be for people to work from the inside behind the acceptable facade of a federal advisory committee to promote government give-aways while working together on the outside to defeat legislation perceived as threatening to big business?" Metcalf asked in a speech before the Senate.

AT&T categorically denies such ideas. "These are technical advisory committees and have absolutely nothing to do with lobbying or legislative efforts," an AT&T spokesman said.

Among the 10 advisory committees dealing with FCC issues, AT&T could use the FCC National Industry Advisory Committee and some other standards committees to at least bring out its point of view, some industry sources believe.

In addition to its formal memberships, the Bell System operating companies have sent representatives to Washington to visit members of Congress to impress upon them the importance of the legislation. Illinois Bell was included in a recent state telephone industry association delegation that went to Washington to visit the key legislators.

Some of the $50,000 which AT&T said it has thus far spent on the legislative effort [CW, May 24] paid for several brochures explaining the impact of competition and the philosophy behind the AT&T-sponsored legislation.

This is the second in a series of articles describing the efforts being expended behind the scenes to inform Washington legislators and others about the pros and cons of the Consumer Communications Reform Act of 1976 [CW, March 22] now pending in both houses of Congress.

NCC Opens June 7

(Continued from Page 1)

papers discussed operating and component experience on various calculating machines and the future possibility of using transistors in computer design.

Specific presentations at the meeting – chaired by J.C. McPherson of IBM – included the performance of the Census Bureau's Univac I, the Burroughs Laboratory computer, the IBM card-programmed calculator, the Electronic Research Associates 1101 computer, the Mark 1 developed by Ferranti and the University of Manchester, the Whirlwind I from MIT, the National Bureau of Standards' Eastern Automatic Computer and a review of Bell Laboratories' work in digital computer systems.

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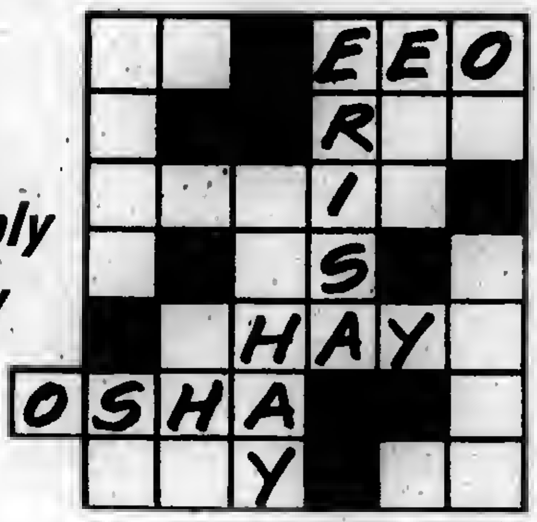

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Rate of Change a Problem

Jargon Seen Stumbling Block for DPers' Attorneys

By Nancy French
Of the CW Staff

SAN FRANCISCO – "The box is in the pen," a speaker who designs software said here recently, instantly befuddling an audience of attorneys.

The speaker pointed out that this phrase has about as much meaning as the word "software" to an attorney who is trying to understand a DP contract.

"Computer jargon is largely terminology for things invented on the run," according to Gerald H. Larsen, president of Unicorn Systems Co., a Los Angeles-based systems design and consulting firm.

"How do you prove in court, for example, that the programs you contracted for are really 'top-down structured programs'?" he asked members of the Computer Law Association.

Are the contract terms met if the programs are "mostly" top-down structured programs? "If a program contains two 'GOTOs,' does that make it not a top-down structured program?" he asked.

Despite 16 definitions of the term 'software' that Larsen quoted from industry source books and distributed to the attorneys, "the industry still doesn't agree on whether 'software' includes documentation," he said.

Rate of Change

The terms are baffling enough in themselves, he said, but the rate at which words are born and die vastly increases difficulties attorneys experience.

Larsen used the term "firmware" to illustrate his point.

"Firmware was born at a time when systems manufacturers offered systems that consisted of some logic circuits that were given a personality through the use of unalterable software."

Firmware has been superceded by a new type of technology, he said. "We can do the same thing in read/write storage – in modifiable control memory," he explained. Thus, the term firmware is virtually dead.

The relationship between hardware and software within a product keeps changing, he said, and contracts must be rewritten to reflect those changes.

For example, a user bought a Model XYZ-1 a few years ago that consisted purely of hardware. Later he replaced it with the Model XYZ-2 which substituted a programmable microprocessor for some of the hardware.

The user should be protected with a contract change, especially when one considers that manufacturers consistently refuse to take responsibility for software problems, he explained.

This type of situation will become more common as users move into fourth-generation distributed processing, and electronics are replaced by more and more microprocessors.

What are the legal rights of the user who buys the hardware, accepting the software free as part of the device, if the system doesn't work as the manufacturer promised?" he asked.

Larsen also expressed concern for the small user who buys a turnkey system such as the IBM System 32.

In such cases, IBM furnishes the user a kind of questionnaire to complete to help determine the parameters he wants. In return the mainframer generates the Industry Application Package for him.

What the user often doesn't realize is how many decisions are parameter decisions that cannot be altered and how many are not, he said.

When this first-time user installs such a system he may have a six-character numeric customer identification system that seems quite adequate. However, he may learn later that he can't change to a new system without making his future data base completely invalid, he said.

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Ford Signs Science Post Bill

WASHINGTON, D.C. – President Gerald R. Ford signed legislation creating an Office of Presidential Science Advisor here recently.

A final bill had been drafted from two similar bills circulating in the Senate and the House of Representatives early this year [CW, Feb. 16].

When the office will take effect is not known, nor is it known when an advisor will be chosen – or who that advisor or persons on the advisory committee will be, a White House spokeswoman said.

Ford's recent request that supplemental funds be appropriated for implementation of the legislation indicated that the White House will act soon, however, a Senate Commerce Committee source said.

NCIC Check Brings Four Arrests

TIFTON, Ga. – A state trooper who stopped a car that was said to be traveling "erratically" here recently ended up looking down the wrong end of a pistol when he approached on foot.

Fortunately for the trooper, the .25-caliber pistol aimed at him misfired. The trooper succeeded in disarming the driver and radioing for assistance.

When additional state patrol units arrived, the vehicle's four occupants were questioned and identified.

An inquiry of the Georgia Crime Information Center's Law Enforcement Data System (Leds) and the National Crime Information Center (NCIC) revealed the auto had been stolen in Pennsylvania. Further inquiries on the auto's occupants indicated the driver was wanted for armed robbery and murder in Kentucky and one of the occupants was wanted for murder in West Virginia.

A search of the auto and its occupants produced several knives, guns and a small amount of marijuana.

The individuals are now in custody.

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Denver Study Finds Small Hospitals Automate First

By Beth Garcia

Special to Computerworld

DENVER – Smaller hospitals in the Denver area may be more progressive than larger ones in computerizing their various operations, a fact that is at odds with the usually held theory that the larger the firm, the more innovative it is.

Surprised at this finding, which "flies in the face of conventional wisdom," the 10 University of Denver graduate students who conducted the 1974 summer study into computer diffusion hypothesized that smaller hospitals may need to innovate relatively early because they cannot afford to pay for additional personnel necessary to perform similar tasks handled on a noncomputerized basis by larger hospitals.

The team pointed out too that hospitals are not "firms" and suggested that smaller hospitals may have more funds for innovation than do the larger facilities.

In addition to discovering the differences in the advance of computer technology among the 15 hospitals selected for a sample, the students found out a little about themselves, too, and what it takes to conduct and complete a research project.

Originally conceived in the "Technology and Modernization Seminar" at the University of Denver's Graduate School of International Studies, the project was funded for $13,400 through a grant from the National Science Foundation's Student Originated Studies (SOS) program. Students were to investigate "The Diffusion and Dissemination of Computer Technology in the Denver Metropolitan Area."

"We soon realized that the project we had conceived would take us five years instead of 10 weeks," the project director, Katherine Nakata, said.

"I think we spent half the summer narrowing it down," according to Tim Collins, one of the 10 involved in the project.

In formulating interviews, Collins found terminology to be a crucial point, noting that "IBM terminology does not apply to Burroughs." Interview training would be an asset for this type of project, he said, recalling the trouble encountered in deciding on questions and limiting interview time.

Roger Morie, another student researcher, pointed to the difficulty in classification. "How do you define a computer?" he asked.

Student Findings

Despite their problems, the students discovered in 10 weeks that, as expected, payroll procedures were the first computerized operations to be adopted by most hospitals; that, with the exception of payroll, a time lag of between four and nine years occurred between the first and second adoption in any one hospital of computerized procedures; and that 1970 was the year that most hospitals began computerizing their medical records and clinical procedures..

Among the eight hospitals in close proximity to one another, five of them have the highest number of computer applications of any in the sample, the student report said.

Among these applications are payroll, accounts receivable, accounts payable, laboratory records, admissions, discharge, surgery reports, laboratory analysis, radiological applications, cardiology, epidemology and clinical surgical applications.

Research interviews also discovered that the use of computers brought increased prestige to the hospital and that while computer use alienated some employees who were fearful of losing jobs, it also helped in a "bringing together" of staff members because of the increased communication needed to make the most complete use of this expensive equipment.

The hospitals in the survey were: Children's Asthma Research Institute and Hospital, Children's Hospital, Colorado General Hospital, Fitzsimons General Hospital, Fort Logan Mental Hospital, General Rose Memorial Hospital, Lutheran Hospital and Medical Center, Mount Airy Psychiatric Center, National Jewish Hospital, Porter Memorial Hospital, Presbyterian Medical Center, St. Anthony Hospital System, St. Luke's Hospital, St. Joseph's Hospital and Swedish Hospital.

One of the frustrations that student researchers encountered was the inability to answer all the questions about computer diffusion, even in this one industry.

Questions proposed for future study were: "Why do individuals, organizations or societies adopt innovations? How does diffusion occur? How important is the competence of advocates of adoption of an innovation in influencing a decision to adopt? Is political clout a more substantial factor than competence? Why aren't larger hospitals the most innovative?"

Though all students acknowledged the immense investment of time and effort in the study, Nakata said: "We gained much more from the practical experiences than any number of courses in research design could teach us."

Privacy Legislation Seen Taking 'Overkill Stance'

By Toni Wiseman

Of the CW Staff

MENLO PARK, Calif. – The privacy legislation which has been introduced so far has taken an "overkill stance," according to Dale Learn, president of Information Sciences, Inc.

"In our 10 years of working with more than 200 organizations on the computerization of employee data, we have never been asked to include political activities, credit ratings and standing with the Internal Revenue Service (IRS) or, for that matter, anything else that might be deemed unethical," Learn said.

While acknowledging there is a continual need to protect confidential information from curious fellow workers, Learn said tight security for keeping files under lock and key and allowing employees to see that information on them is correct and up-to-date are usually successful in this regard.

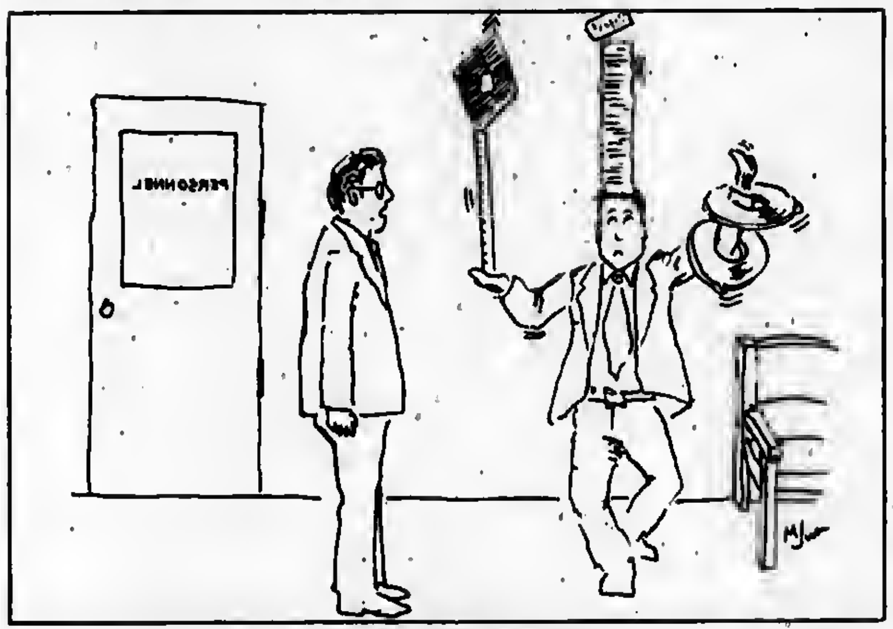
"There is also a prevailing notion that the computer is a depersonalizing force or a threat to individuality," he said. "In our experience, the computer has just the opposite effect.

Key to 'Repersonalization'

"The computer is the key to the repersonalization of society. It is the computer that implements the movement away from treating citizens and employees in the impersonal mass and back to individual assessment on the basis of personal qualifications, aspirations and capabilities, regardless of race, creed, religion, sex or national origin," Learn said.

Learn predicted that employers will find themselves subjected to "costly, burdensome and totally inappropriate" laws in the name of the cause of the privacy.

The potential damage is enormous, he said, while the real purpose of employee information systems is to help management in its "quest to know" and to manage effectively.



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No Longer 'Wizards of Change'

DPers Told Awareness of Nontechnical World Important

By Don Leavitt
Of the CW Staff

DALLAS – Data processing has lost much of its mystique, and most managers now realize it is important to show the DP staff life outside its own technical world, according to Bill C. Zumwalt, director of DP for Waples-Platter Co.

Since they are no longer "wizards of change," DPers must be communicators, he told a workshop at a recent Computer Caravan. Career paths can be seen now not only in data processing, but through DP to other areas, as the employee's own ambitions and capabilities permit, he added.

Although he encouraged movement within the positions of the staff, he later argued against the formalities of career pathing, job definitions and the like. Management can motivate employees, but it cannot direct them into more than they want to do, he said.

The fact is that anyone interested in moving ahead "already knows what the job he wants requires," and he can find out whatever else he wants by asking, he said. By the same token, such an unstructured approach allows employees to define what they themselves would like to do next, Zumwalt said.

The employee has to define his own goals and understand his own limitations, under Zumwalt's plan. And the approach to this project is just like the approach an analyst would use on any project, he said.

Four Basic Phases

There are four basic phases, although, since humans and uncontrollable factors are involved, the phases may well overlap one another and be repeated as events dictate.

In the first or analysis phase, the employee has to list his or her personal and career wants. And the worker who feels his current position has enough challenge should recognize that that is not necessarily a negative attitude.

In the planning phase, the employee reviews the entire list of wants put together in the earlier phase and selects the goals and objectives to be pursued in particular. To move ahead requires advance planning, Zumwalt said, with definite major and minor accomplishments as goals.

Measurable short-term and long-term objectives keep this phase manageable, although it is "probably the most difficult aspect of the whole process," he commented.

The design and implementation phase of a career plan includes the steps the employee takes to attain the goals set up earlier. Just as simply stated, the review phase is an audit operation to determine how outside changes affect plans and how well the steps taken earlier succeeded.

A More Direct Approach

After Zumwalt described the theoretical approach, a member of the audience told of a more direct means his company uses to make new DP staffers aware of the other parts of the company. "We throw new programmers out in the working units of our operation for at least two weeks.

"After that, they have some time in accounting, to see things from that angle. Then we put them to work in data processing. And it works," he said. "With that preexposure, the terms we encounter working with the user departments mean something."

And to maintain that level of understanding, the DPers are sent back to the field for a week or two of reorientation every year or so, he said. This approach has paid off nicely: The level of contribution and the productivity of DPers with the exposure to the real world is "much better" than for those without it, according to the speaker.

System Seen as Necessity, Not Luxury for Colleges

By John P. Hebert
Of the CW Staff

HANOVER, N.H. – "The computer is no longer a luxury for colleges, but a necessity." It is the single most important element in long-range planning a college can have, according to John G. Kemeny, president of Dartmouth College here.

This is "the most important use of the computer to institutions at this time: for planning – for one year, five years, 10 years and beyond," he told a group of more than 200 women administrators representing 75 colleges who had gathered recently for a two-day conference on the use of computers in educational administration.

The computer allows many people to interchange thoughts and ideas in long-range planning and to play the game of "what if" with such things as rates of inflation, fuel prices and student body size and any and all combinations, he said, citing the necessity of computer modeling in planning.

"Why, in these times of tight budgets, did the board of trustees allocate $2 million for a new computer?" he asked.

"The computer makes the student a little smarter, and it makes the faculty and administration a great deal smarter," he said, answering his own question.

Educational Usage Growing

Using the analogy that a university would not consider operating without a library as a resource or a theater for its drama department or labs for its chemistry department, he cited the growth of computer usage in the educational process.

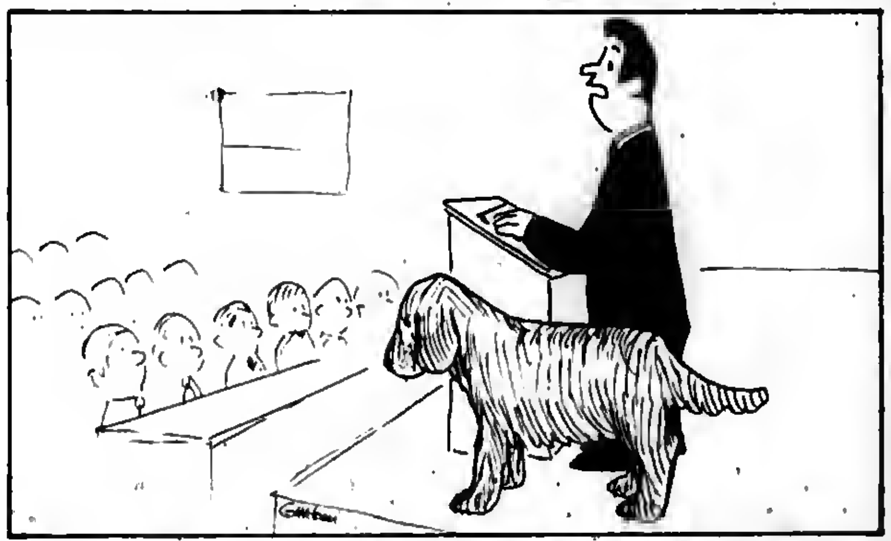
"Ten years ago, I would conduct a class and then given an assignment and send the students off to the computer. Now I have a terminal and closed-circuit television in the classroom and move between the terminal and the blackboard, using each as a teaching tool, complementing one another," Kemeny said.

"A university that does not provide easy access to computing for its faculty, students and administration is failing in its job and today most universities are failing in this," he continued.

Kemeny also discussed the services an academic computer center must provide, including a first-rate research facility for faculty, free and easy access by students without red tape on a system that is easy to learn and various administrative uses.

These administrative uses were broken by Kemeny into two major segments: the simple uses such as payroll, which are best maintained on a separate computer, and the building of large data bases on the major computer, for a variety of uses.

The Board of Trustees of Dartmouth is so convinced of the necessity of the use of computing in long-range planning that a terminal is available at its meetings and is frequently used to answer questions and provide projections, Kemeny noted.



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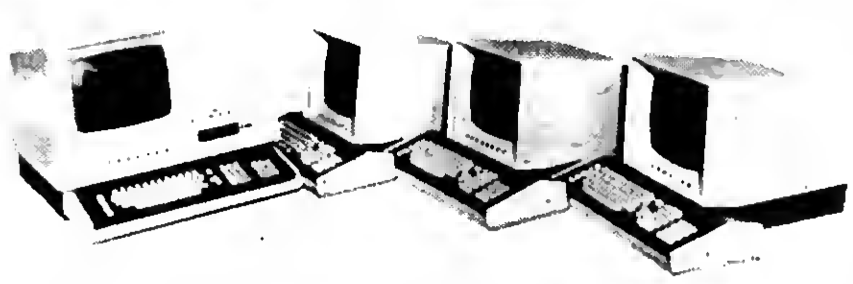

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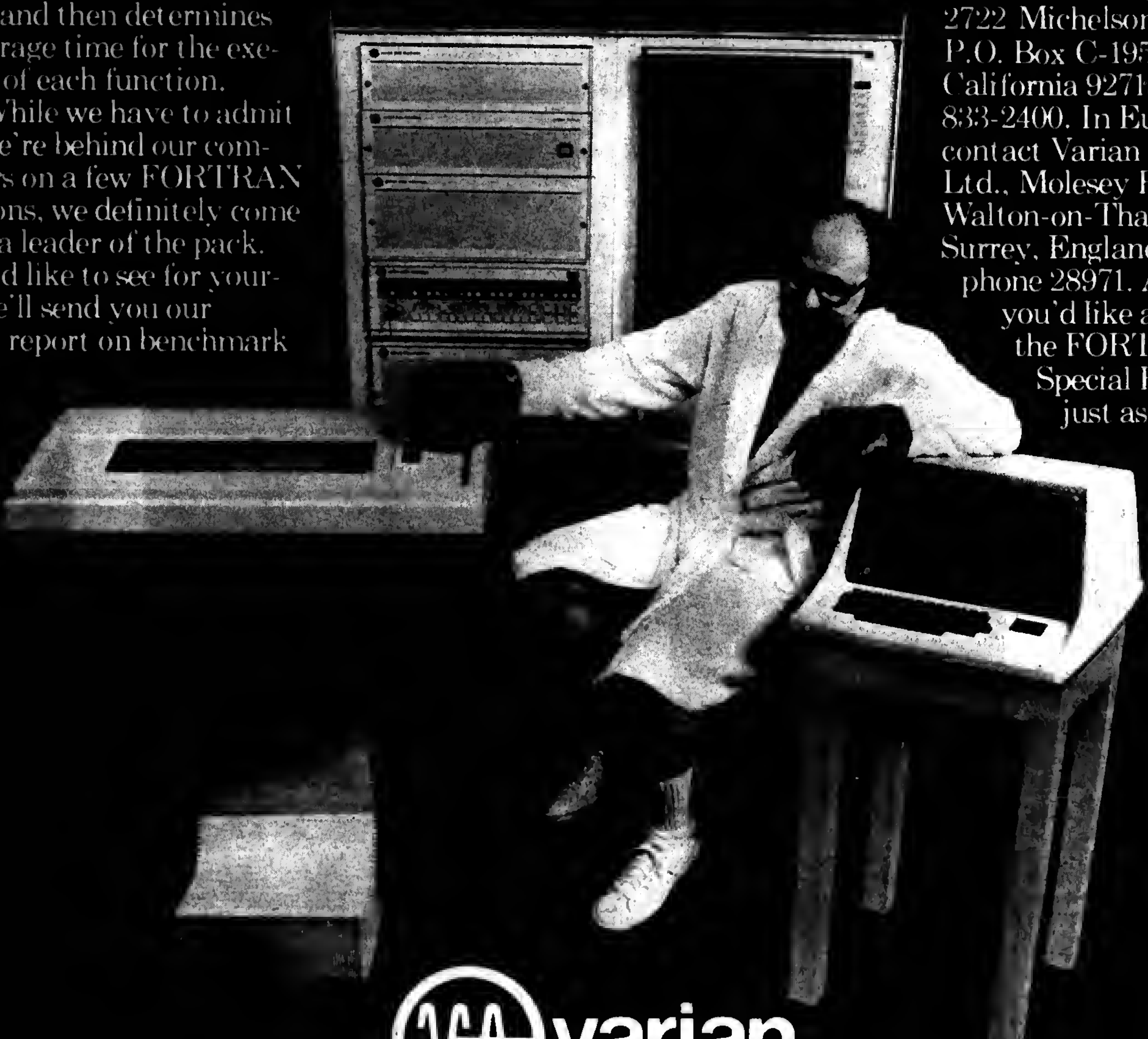

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Helping a Fast World Move Faster

No 'Revolution' Yet – DP Doesn't Touch Daily Lives

BOSTON – "The real 'computer revolution' hasn't happened yet because people don't yet use computers in their daily lives,'' Dr. John McCarthy of the Artificial Intelligence Laboratory at Stanford University said here recently.

"When most people have home computer terminals with access to all the world's public information, it will revolutionize the way we conduct our personal business, the way we learn new skills, the way we read, the way information is published and sold, the conduct of political and other controversy and how we decide what to buy," McCarthy told a symposium.

"The technology for information utilities serving home computer terminals is already here and cheap enough and will get much cheaper, but the organizational problems of creating new public utilities are formidable," he continued.

The timeframe for the occurrence of this phenomenon will be "within 20 years and beginning with the next five," he said.

This is when we can expect "the home computer terminal [to] revolutionize the way we conduct our personal business as much as the automobile revolutionized the way we get around."

Similar to Today's Terminals

"The terminal itself will be rather like those already in use by computer programmers. airline and other reservation clerks, etc., and consist of a typewriter keyboard and a display for text and pictures," McCarthy predicted.

"The terminal will be connected by the telephone system to a time-shared computer" with access to book, magazine and newspaper files, catalogs, airline schedules and files on government and commercial information, he said.

The obvious benefits will be the instant retrieval of any document and the elimination of a flood of paper materials, he claimed.

In the first case, "since the desire to read a particular book or article is often fleeting, much more will be read if access is guaranteed and immediate," he explained.

In the second, "trees aren't cut down and air pollution doesn't result from burning the [paper goods]."

Apparent Disadvantages

The immediate apparent disadvantages would be the nonportability of the terminal, lack of subscribers because so many people are TV enthusiasts and the raising of "1984-ish possibilities," McCarthy said.

However, "the home terminal system doesn't need more than a small minority of the population as subscribers to be economical . . . and even the TV fan will be tempted."

The eventual advantages of such a home terminal will be in-depth news coverage, the disappearance of advertising which forces itself upon the reader or viewer, the possibility of frequent revisions of articles and books (with the original copy retained) and the expeditious handling of public controversy with immediate reply, he continued.

Politics to Gain

This immediacy of reply will also improve both politics and journalism, according to McCarthy, because public figures and journalists will not be able to exercise their present ability to "hit and run."

As a result, he said, "freedom of information can be made more effective. If all public information has to be kept in publicly accessible computer systems, then the information will be nationally available."

In addition, the information utility will have the effect of promoting intellectual competition, which will "make intellectual life more interesting," McCarthy said.

Problems Must Be Solved

But "between us and the home information system lie a number of problems, some in developing suitable low-cost terminals, some in the programming technology of time-sharing, some in the economics and politics of communication systems and some in the attitude of the public and government toward innovation," McCarthy said.

"The most economical system might be a specifically designed store-and-forward system configured to give fast turnaround for short messages," he suggested.

Not in Good Shape

In the computer technology arena, he said, major computer manufacturers such as IBM, Control Data Corp. and Univac are not in very good shape.

"IBM customers are organized in such a way that time-sharing is very expensive because of their interrupt structure, expensive terminal multiplexers and their dedication to the archiac half-duplex method of communication . . . and almost unchangeable operating systems.

"Smaller companies, like [Digital Equipment Corp.], are in a somewhat better position. However, none of these difficulties are permanent," McCarthy said.

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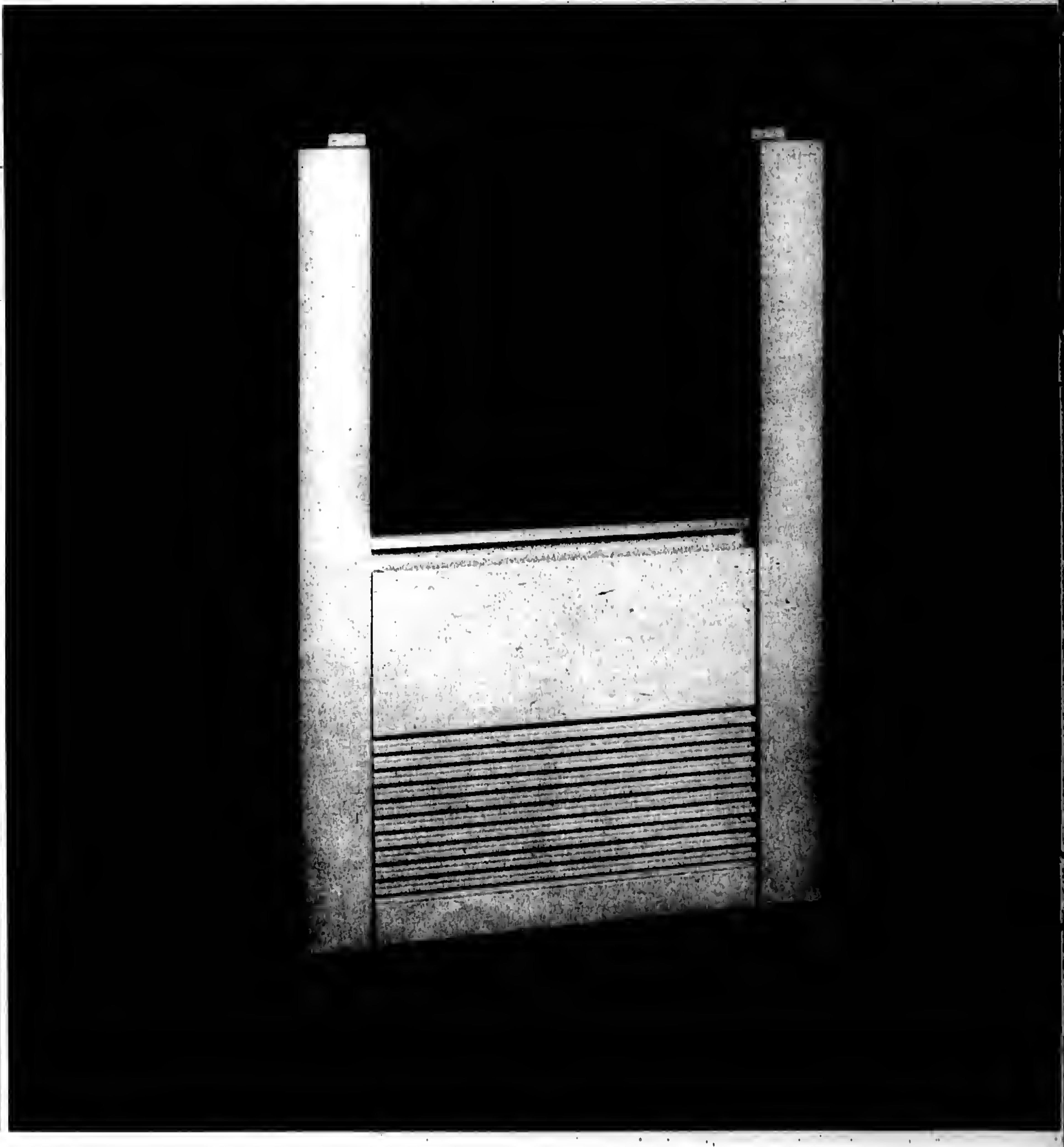

In FAA Effort to Improve Security

Westinghouse Wins Baggage-Screening System Contract

PITTSBURGH, Pa. – The Federal Aviation Administration (FAA) is in the process of awarding contracts totaling $194,000 to Westinghouse Electric Corp. here for a minicomputer-based prototype system for screening checked baggage at airports, the FAA said.

The system, controlled by a Digital Equipment Corp. LSI-11, is designed to provide automatic baggage screening and works on the principal that explosives will absorb more X-ray energy than surrounding material, the FAA spokesman said. The increased absorption rate would be sensed by the mini and signal an alarm, he added.

The system will be an advanced version of a demonstration model built to inspect hand-carried luggage and already tested at the Washington National Airport, a Westinghouse spokesman said.

The system for screening checked baggage will be more difficult to develop, according to Arthur E. Anderson, who heads the Westinghouse development effort. "It must operate at faster speeds on larger pieces of luggage," he said, adding that the system is being designed to screen bags at the rate of one per second.

The checked baggage system will require a more sophisticated computer program designed to operate at higher speed than is required for a hand-baggage system, Anderson said.

The major advantage of the system over conventional X-ray systems is that it will not have to be monitored by security personnel and is not subject to human error, according to the FAA.

The demonstration system for screening hand baggage consists of a gamma-ray source mounted within a specially constructed container that provides two narrow fan-shaped beams aimed across conveyor belts on each side of the source, Westinghouse said.

As baggage is carried along the conveyor, it passes between the gamma-ray source and detector arrays that measure the radiation passing through the baggage.

The differences between various types of baggage is compensated for by the minicomputer, and the system sounds an alarm when the radiation transmitted through a preselected area is reduced by a predetermined amount, Westinghouse said.

Guns or other explosives cannot be masked using this system, a spokesman explained, because the masking material provides even further reduction in radiation passing through the bag.

The LSI-11 monitors the system to assure that there is no deterioration in system performance.

To minimize radiation, exposure to the fan beam is restricted to the active detector areas on each side of the conveyer belts.

Source strength is also limited to the minimum value needed to provide accuracy for measuring the radiation reductions.

Privacy Group To Hold Health Record Hearings

LOS ANGELES – The Privacy Protection Study Commission will conduct hearings on the recordkeeping practices of health care providers here June 10-12 to help determine whether confidentiality safeguards should be applied to medical records.

Individuals who wish to testify should submit their views in writing no later than May 30 to the commission's executive director in Washington, D.C.

The June hearings will focus on the conditions under which disclosures of records should be made by health-care providers.

Use of medical records in nonmedical settings such as insurance, consumer-reporting, education and employment will be postponed to a later date, the commission said.

For the present, the commission wants to know what standards and customs govern the content of a medical record, how they are enforced and to what extent the content is influenced by the records' nonmedical users.

The commission is also interested in whether health care providers permit patients to inspect or be informed of the contents of their records and what consequences have resulted from permitting individuals access to their records.

The hearings will be conducted in Room 8544 of the Federal Building here, which is located at 300 North Los Angeles St.

The commission is located at 2120 L St. N.W., Washington, D.C. 20506.

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Records Show IBM Fares Poorly in Competitive Bidding

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Previously secret internal IBM documents released in Federal District Court here revealed what many users already knew – IBM does not fare well in competitive situations.

At the same time, however, the documents revealed competitive bidding happens in less than half of the situations overall, and competitive bids are taken in less than 20% of the cases for the most popular computer models.

The information came from "Decision Summaries," prepared internally by the IBM Data Processing Division's Commercial Analysis Department for 1970 and 1971, but clearly indicated continuing trends.

In the figures, competitive situations were those where two or more firms bid for a single installation. Noncompetitive were those situations where the user directly contracted with a vendor without asking for other bids.

In the area of the 370/145, for example, competitive situations accounted for 16% of the decisions made by users in 1970, and IBM got 37% of these 302 orders.

The firm received 95% of the remaining 1,636 orders placed on a noncompetitive basis, giving IBM an overall rate of 86% of the business in this area for the year.

Medium Systems Area

In the medium systems area, identified as the market for 370/155s and 360/50s, users asked for bids in 12% of the 1,146 decisions made in 1970.

Out of the competitive situations, IBM got only 38% of the 133 decisions made, but it received 97% of the 1,013 noncompetitive orders placed for equipment, giving IBM 90% of the orders for the year overall.

By September of the next year, the percentage of competitive situations had increased to 27% of the total orders coming in, the figures showed, but IBM was doing better in head-to-head situations with a win rate of 64%.

In the large systems area (370/165, 360/65), users evaluated competitive equipment in only 19% of the cases and IBM won 59% of the time. However, in the area of noncompetitive bids, IBM received 94% of the business for a total share amounting to 87%.

Even a breakdown of the figures of competitive bids proves interesting in this case.

In the cases where IBM was "protecting installation," the firm won in 85% of the cases against competition, while it won in 77% of the cases where it was "protecting on-order" systems.

However, in new installations where both IBM and competitive systems were proposed, IBM won in under 50% of the cases, giving the overall 59% win average for IBM against competition.

In addition, those figures are for 1970 as a whole and the firm noted that, as of September of 1971, "IBM's head-to-head win rate [was] 36%, down from 59% in 1970."

In the intermediate systems area (370/135), IBM got 60% of the total business, even though it received only 31% of the competitive orders.

In all, there were 1,675 decisions, of which 760, or 45% were competitive in 1970.

However, in the next year, the competitive orders had fallen to 20% of the 3,008 total and IBM had increased its market share to 84% of the total decisions.

It was able to do this by getting 95% of the noncompetitive orders and 40% of the 597 competitive situations.

The increase "is largely due to Model 22 and Model 135 orders received in noncompetitive situations where IBM's decision share has increased from 82% to 95%," the planners explained.

Once again, IBM did better in situations where it was "protecting installation" or "protecting on-order," with competitive win rates of 37% and 40% respectively. In new installations with competition, the win rate fell to 28% of the cases.

50% Success Rate

A rundown of the figures showed that, in the area of very large systems (370/195), users only asked for bids 12% of the time and that IBM had a 50% success rate on these competitive bids.

However, in the 88% of the cases where there was no competitive bidding, IBM got 87% of the business. Overall, IBM racked up 82% of the orders.

In the System/3 and 360/20 area, competitive situations accounted for 21% of the total of 6,315 orders placed during the 1970 time frame.

IBM was able to get 42% of the orders in situations where there was competition, but it received 96% of the orders from firms who chose not to hold competitive bidding.

In all, IBM got 85% of the orders in this category during the year.

In the area of process control systems, there appeared to be more competitive bidding, with 72% of the decisions made on a competitive basis in 1971.

Similarly, the IBM share of this market dropped substantially in this area, where IBM got only 30% of the total orders. Where there was competition, the IBM share was 22%, but, where there was no competition, IBM received 48% of the orders.

European Banks Opt for Network

By Ivan Berenyi
Special to Computerworld

New York's Chemical Bank has decided to follow a trend among large, international merchant banks in opting for a distributed processing network to link its six main European offices.

Twin Digital Equipment Corp. PDP-11 processors will be installed in each office, one permanently on standby.

The decision reflects growing alarm among former teleprocessing users at the cost of international leased telephone lines.

Although there is no sign that clearing banks, whose major business is done via a network of branches within one country, are rebelling against telephone tariffs, the costs of international lines are now such that merchant banks can only justify their use where transactions of a large unit value are involved.

Furthermore, regional autonomy has always made more sense in Europe, where each country has its own set of banking rules and conventions that can differ considerably. A central computer system designed to handle them all requires exceptional flexibility.

The six offices of the Chemical Bank will each handle independently the sort of work that in a traditional bank computer system would have been passed down the line to the central installation. The configuration of each will be similar, but their applications software will be adapted to local conditions and capable of further modification.

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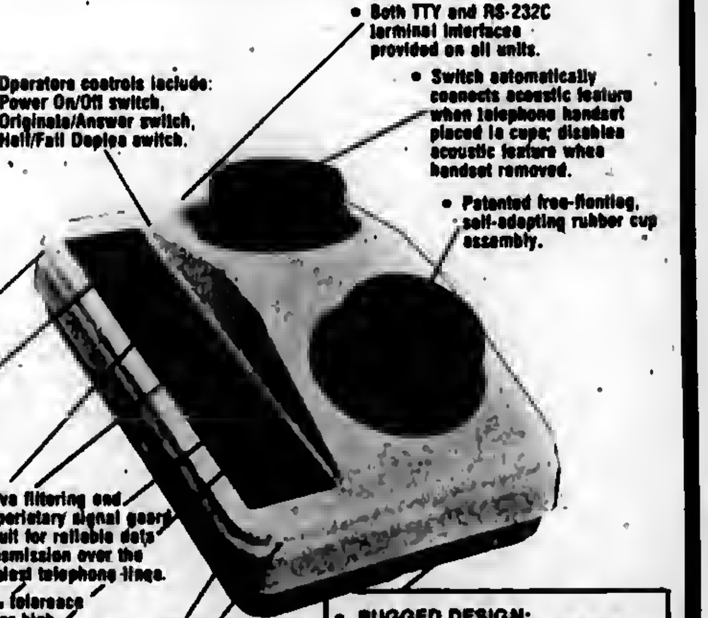
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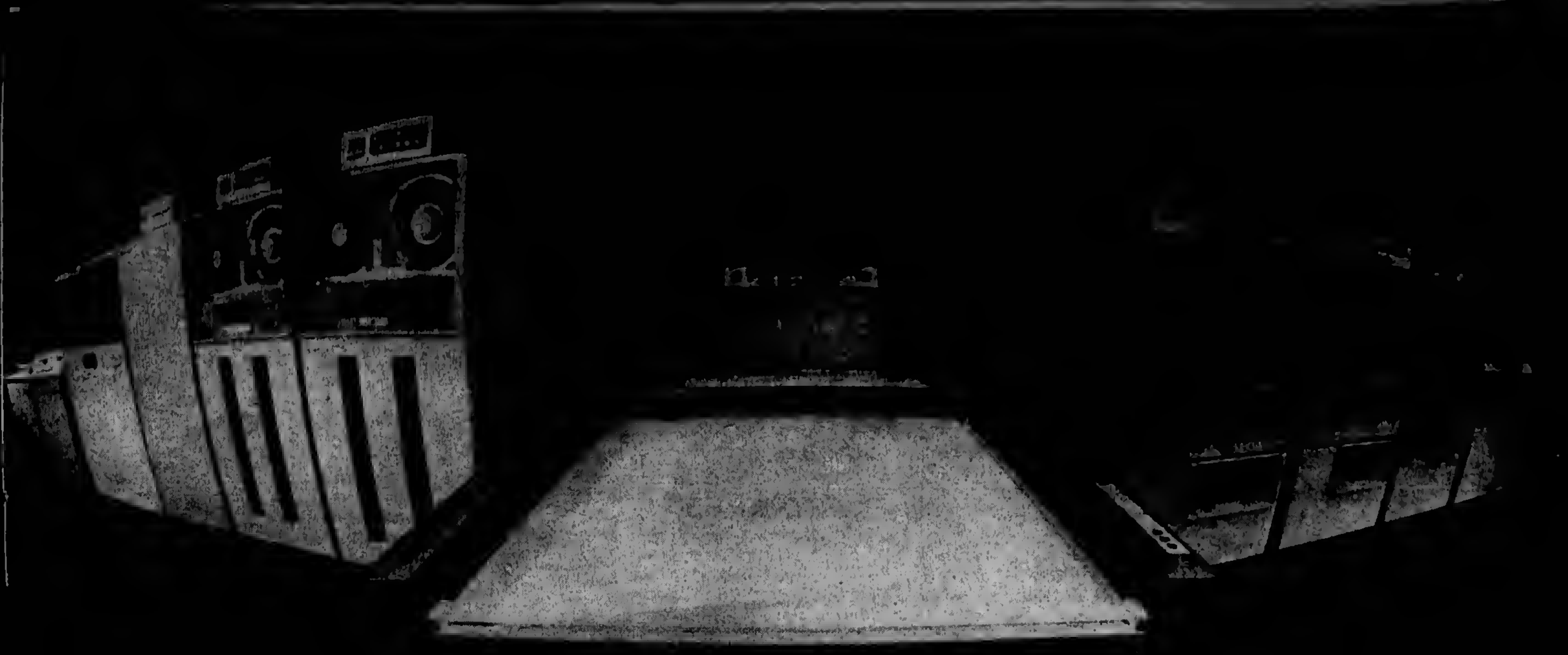

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CALCOMP

Editorial

A Warning to Users

The recent deliberate and tragic bombing of the Central Maine Power Co. (CMP) again pointed out the vulnerability of DP installations.

Fortunately the center continued operating even though two explosive devices were placed on floors above and below the computer room [CW, May 17]. The center escaped damage probably more as a stroke of luck than because of careful corporate security measures.

A day after the blasts, an FBI spokesman said there was no evidence the DP center had been the actual target. Nevertheless, officials were not sure exactly how or why those responsible entered the building. Employee identification cards were routinely required to enter the new CMP building.

The DP manager at CMP had backup facilities and files available in the event of a catastrophe. But he also admitted that physical security procedures were under review after the bombings.

It is fortunate that no lives were lost in the Maine incident. But regardless of the motives involved, it is clear that corporate DP and other security is becoming more and more important.

The days of showing off a DP center behind glass off an unrestricted lobby are gone. Users have to realize their DP installations are the nerve centers of their corporate operations.

Nobody likes seemingly redundant security measures which have to be followed day after day. But employees like a bomb-damaged facility even less. The officials at CMP thought that events like bombings don't happen to isolated Yankees in Maine. Now they know better, and it should be a warning to users everywhere.

SILENCE
?
CONTINUING LOBBYING EFFORT
CONGRESS
PRO MA BELL & FRIENDS
CON SPECIALIZED CARRIERS & USERS
CONSUMER COMMUNICATIONS 'REFORM' ACT HEARINGS
Computerworld

Letters to the Editor

Bell's Need for Bigger Profits Would Cause Phone Costs to Rise

Ma Bell's contention that permitting competition in the form of specialized carriers and forbidding Ma Bell to force a Data Access Arrangement to be used with competitive equipment would result in an increase in phone rates does not indicate competition would increase the actual cost of providing phone service [CW, May 17].

Rather, Ma Bell intends to get at least as much profit as she would without competition and therefore will find some way to raise the rates at least enough to realize the same profit as would accrue if she provided all the services and equipment.

This is very much like the attitude of the Postal Service which is talking about charging postage on data transmitted to a central computer.

I can envision the day when I carry my box of cards over to the local Cybernet office to submit my job over the counter and find in the lobby someone from the Postal Service who will weigh my cards, another from the phone company and others from United Parcel Service, Western Union, etc., each to collect his fee for transmitting my data.

There will also be someone from the Transit Authority to collect bus fare and maybe a cabbie to collect cab fare if it's discovered I have been evading such by walking.

Bret Hooper

Nashville, Tenn.

Phones to Go Way of Railroads If Government Allowed to Step In

Regarding the editorial, "Backing Bell Blindly" [CW, May 17], it is obvious *Computerworld* is knocking Bell blindly. The editorial spoke of competition; where is competition if one company is regulated and the others are not? If both are regulated, it is just a shared market.

CW seems to have all the answers in a 6-in. editorial which makes statements even the Federal Communications Commission (FCC) does not make. The FCC said the change won't hurt the telephone companies, just the customers.

What is wrong with an open debate of the issues? Look what the government did to our railroads. Maybe it will do the same to the telephones if we don't speak up.

D.G. Hamlin

Bellevue, Wash.

AT&T Losing Ground Since '64

I am concerned by the tone and "substance" of the April 12 editorial in *Computerworld*. The evidence I have seen indicates that the allegation about "the record profits being racked up year after year by AT&T and its operating companies" is totally misleading.

By consulting the AT&T annual reports for the years 1963 through 1975, I found that AT&T's net income increased over the previous year for most of that period. This was not true for 1970 and 1975, when net income declined.

However, increase in net income is not a realistic measure of economic gain; some comparative figure, such as rate of return on invested capital, is much more appropriate. Examining the statistics on this basis, it is clear that AT&T has actually been losing ground since 1964, rather than reaping unreasonable profits.

J.K. Patberg

Plainsboro, N.J.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
June 2, 1971

WASHINGTON, D.C. – The Federal Communication Commission (FCC) approved unlimited entry of new carriers into the specialized microwave common carrier field and was expected to consider site applications from 33 separate firms planning to provide services to computer data users.

– – –

WHITE PLAINS, N.Y. – IBM cut prices across-the-board 15% on all 360 and 370 tape drives, disk drives, printers and controllers. New fixed-term lease plans of 12- and 24 months were available to users at savings of 8% and 16%, respectively.

Eight Years Ago
May 29, 1968

LOS ANGELES – Scientific Data Systems (SDS) announced the SDS 945, the third in its line of time-sharing computers. The 945 could accommodate up to 24 simultaneous users and up to 64 authorized users with a total file space of 8M characters.

– – –

WHITE PLAINS, N.Y. – IBM added three management information systems (MIS) to the repertoire of the "large" IBM 360s (Model 40s with 131K or more). Both the Information Management System (IMS) and the Customer Information Control System (CICS) were new systems; the third, the Generalized Information System (GIS), was originally scheduled for release in January 1967 but was decommitted.

The ACM Election

I write this while flying back from New York, where yesterday (May 15th) I watched the counting of ballots in the most controversial election in almost thirty years of Association for Computing Machinery history – and where I was, *mirabile dictu*, elected president for the next two years. Dan McCracken, known to just about every CW reader as a prolific and popular textbook writer and as a giver of technical seminars. and to every ACM member as a wide-ranging speaker on the humanist side, was elected vice president. Each of us, under rather different circumstances, had been refused nomination by the ACM Establishment, each of us benefited from the unsolicited support of good friends and outraged associates, each of us was nominated by petition – almost unheard of in ACM – and each of us was elected. Great show!

And that's what I propose to write about –. the excitements. I'll be in immediate touch with ACM key people about substantive matters and, after I take office July 1st, with the entire membership. We will be entering a new cycle, a cycle of change. Hopefully it will be for the better, and almost certainly it will be for at least four years – a time also of major change in the computer world and the Real World. But for today, let me tell you CW people about the White Hats and the Black Hats.

The story begins with my election in 1974, by fairly normal processes, to the vice presidency. I had been a council member-at-large for some years, NCC representative, worker on the finance and standards committees, and so on. I was one of the few charter members of the Association, and had been active one way or another for virtually the entire three decades. On the other hand, I had been fairly loud in my dissatisfaction with the dominance of a small group of members. Initially they had been math professors and numerical analysts, later; when the name and specialism became accepted, "computer science" people. Some were very esoteric indeed, others had a good eye for power and advantage; all, without exception, were Establishment – and as I said in a recent column, Highbrow rather than Human.

Difficulties in the Executive Suite were immediate. Jean Sammet, the president, was at least as abrasive as I, and without my humor. And she is a workaholic: not even microscopic pebbles went unturned; not a financial fruit fly, let alone a sparrow, fell unnoted. I, on the other hand, have never been addicted. And most of the projects that merited effort I disagreed with, notably the proliferation of unreadable academic publications. So, at the end of the two-year period, it was not surprising that the nominating committee, headed by Tony Ralston, Jean's predecessor, refused to put me up for president.

Where they made their first blunder was in not discussing it with me. For several reasons, not least my plan to relocate to California, I would probably have refused nomination. Certainly I would have done so if I had been offered another shot at a council seat, as was the incumbent secretary when he decided against running for that office a third time.

The second Black Hat mistake was in turning away the supporters for McCracken for a vice presidential nomination. A clear choice between a gentle, hard-working non-Establishment candidate and a strong Establishment one would have been salutary: they were afraid to risk it. White Hat committees sprang up like dragon's teeth; in no time at all, each of us had been nominated.

The Establishment must have realized from the start that Dan would be elected. Their only hope of avoiding at least four years of lessened control lay in defeating me. That would give them a two-year breather to work against Dan, and a precedent for rejecting petition-nominated presidential candidates.

So a two-pronged strategy was mounted. On the one hand, complete silence – unbenign neglect – about the unorthodox scrimmages upstairs was offered the general membership. On the other hand, highly unusual letter-writing and telephone campaigns directed at influential members (chapter chairmen, committee heads, and so forth) were quietly begun. And at this point the Sammet/Ralston forces made a third slip: they backed the wrong horse! The letters urged a vote for Carl Hammer, and not for Peter Denning, the younger and more academic of the two nominating committee candidates. The point, of course, was to concentrate the Establishment and the anti-Grosch votes. But, putting aside unresolvable questions about backlash, the tactic was faulty; instead of Hammer and Denning splitting the conservative vote, Hammer and I probably split the Old Fogy vote! Anyhow, the result was Hammer 2146, Denning 3134, Grosch 3756 (the total, 9070 including blanks, was the highest vote, by a considerable margin, in ACM history).

Also, before the end, breaking a written explicit agreement to keep the battle "out of the papers," a long and argumentative editorial about election issues appeared in the ACM *Communications*, thereby making it possible for me to reply in this column. I had until then been very careful not to use it for personal ACM advantage during my vice presidency and during the campaign – something the Establishment had been nervous about since early 1974. Whether I helped myself is not certain, but on balance it was probably a fourth Black Hat blunder.

Anyhow, I have two things to be grateful for this morning: the dour grip of the Establishment on thirty thousand ACM members has been weakened – and I can have fun telling about it in *Computerworld*.

Herb Grosch

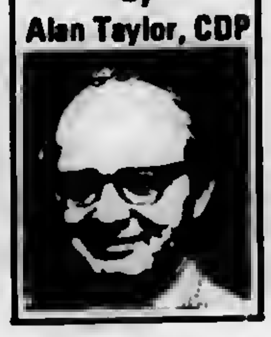
An Analysis of Three Alibis

Agencies' Objections to GAO Report Full of Holes

The report seemed clear enough when it went to the president of the U.S. Senate and speaker of the House of Representatives, themselves elected representatives of the people.

"Many federal agencies use computers to initiate actions that are not reviewed by people." This was the start of the cover letter from Elmer B. Staats, the U.S. controller general, reporting the problems [CW, May 17].

The Taylor Report
By
Alan Taylor, CDP



To underline where the emphasis was – reviewing what computer systems had already initiated and perhaps performed – was Staats' comment that the study had been made pursuant to the Accounting and Auditing Act of 1950 and the Budget and Accounting Act of 1921.

To anyone reading the letter, never mind the report, it was clear that the wholesale payments of funds and other vital decision making being made without later human review was at the heart of the General Accounting Office's (GAO) concern. Not mistakes occurring, but mistakes persisting when they should have been previously recognized.

This was underlined by the recommendations, which called for two specific actions:

- That internal auditors, "to carry out their responsibilities," participate actively in the design, test and review of Automated Decision Making Applications (or Admas to quote the latest barbarism that Washington has wished upon us).
- That periodic testing after implementation of decisions be both initiated, reported on and monitored outside the responsible agency.

Well, those two ideas seem reasonable enough when faced with the $25 billion/year involved and the many errors that were reported. The insinuation that the agency internal auditors had not been fully carrying out their duties and that the agencies hadn't been doing a good job either was clear enough, so I turned to the agency reviews of the report to see what they had to say in their own defense.

There were three major printed reviews, those from the Department of Health, Education and Welfare (HEW), the General Services Administration (GSA) and the Department of Defense (DOD).

After a bit of reading I became interested in the way each had constructed its response. DOD, for instance, wanted to eliminate the concept of anyone outside the agency being able to routinely monitor what was going on regarding these unreviewed decisions.

DOD did not; however, address this issue directly. Instead it raised a potentially valid argument about the General Services Administration's charter: "*We interpret GSA's charter in the ADP field to address procurement of ADP equipment, supplies and services. Your report is aimed at a different arena.*" This was the only justification DOD gave for not wanting the agency reporting to an outside, independent body.

Now, this is nonsense. If GSA is not the correct body then, unless there is no correct body, the recommendation of outside reporting is still valid. If, in fact, it is the group to monitor the operation that DOD objects to, then that, or the need to set up such a group, is the only change that can be based upon such an objection.

The charter question certainly evades entirely whether DOD should be trusted to see that public money is properly given out without independent review.

GAO Support?

Moreover, in DOD's evasion and its attempt to downgrade the GAO report (to a study and a wishy-washy set of "shoulds" instead of being a formal report calling a set of "requirements"), this alibi did much to support the argument for outside monitoring. Certainly nothing in the DOD response gave any reason outside monitoring is not needed.

The GSA was perhaps in a different position since it is the potential candidate for watching over the other agencies. Sure enough, it "strongly agrees with the following GAO-recommended solutions. . .preimplementation and postimplementation audits by independent groups."

Despite this, however, it quietly changed both of the other two recommendations it favors (cyclical system monitoring and joint system design by users and DP systems analysis) to eliminate the role of the independent, internal auditor. This independent role was, of course, a major GAO recommendation.

No Reason Given

Like DOD, GSA gave no reason for eliminating the auditor role

(Continued on Page 20)

Independence of DP Auditors Poses No Threat to DP

Reader Commentary

By Marianne Marino

Special to Computerworld

The April editorial in *Thruput*, the journal of the Association of Computer Programmers and Analysts (Acpa) revealed a basic misunderstanding about the DP audit profession which led me to wonder whether such a view is generally prevalent in the data processing community.

The editorial suggested that DPers were in danger of losing control of and responsibility for the future of the DP industry, should DP auditors "begin to certify computer installations, the adequacy of computer systems designs, the adequacy of program and system controls, adherence to comprehensive standards and the completeness of project documentation."

In conclusion, the editorial promised that future issues of *Thruput* would examine "the areas where [DP auditors] have been successful and the steps we [Acpa/DP] might take to halt this encroachment into our own field."

The misunderstanding, as I see it, centered on the premise that if auditing/accounting organizations such as the American Institute of Certified Public Accountants (AICPA) set "the pace in standards development and the auditing of computer application systems," then DP people "may find that areas which have been our province. . .have been taken over by the auditors and accountants." Nothing could be farther from the truth.

The DP auditor is first and foremost an auditor, albeit one who specializes in data processing. Within the organizational hierarchy, the auditing profession is and will continue to be a staff function – an aid or service to management.

As such, the auditor offers suggestions or recommendations to the recipient(s) of the audit report, namely, the auditee(s) and his managers. This is the extent of the auditor's authority. The authority required to implement or enforce a recommendation belongs only to management; therefore, it is difficult to see how the auditing profession could gain control of the data processing industry.

Independence a Must

The essence of the auditor's effectiveness is his independence. In order to maintain that independence, the auditor must be continually vigilant lest he cross the fine line between the "doers" and the "reviewers."

Once the auditor begins to perform the function he has previously assessed, he ceases to function as an auditor. That it is a fine line, there is no doubt.

Witness the many opinions, both auditing and data processing, regarding the extent of the DP auditor's participation in the development of a new system – i.e., should he be a full-time member of the project team or merely review project development at designated milestones?

Management relies on the auditor's independence for objective confirmation of the line staff's status reports. In most organizations of any size, management is substantially removed from the day-to-day functioning of its various departments. Particularly in technical areas, top management may lack a working knowledge of the intricacies involved in maintaining a valid, timely and efficient operation.

Thus managers lean ever more heavily on support staff to supply accurate, unbiased data for the decision-making process. This information does not supplant, but rather complements the data received from the operations staff.

Hopefully, the auditor, whether DP or otherwise, is appreciative of the viewpoints of both operations and management.

Should the auditor cross the line and begin to implement data processing policies and procedures, he would lose his value to management as a third-party data source. He would become, in effect, a data processor, and management would have to look elsewhere for its third-party opinions.

On the other hand, the fulfillment of the auditor's responsibility to management may require that he try to impose some semblance of order and control where such is lacking.

Thus professional organizations like the AICPA may propose the development of uniform standards and procedures to guide auditors in the conduct of their duties. But whether these standards and procedures are directed to the audit function itself or through the auditor to the data processing community, they are never imposed by the auditor. Only management has that authority.

If the DP audit profession has been "successful," as the *Thruput* editorial purported, it is only because management has found something of value in its recommendations. But that is hardly cause for weeping and gnashing of teeth on the part of DP (or is it Acpa?).

Evaluation Function

Performance evaluation which is the *raison d'etre* of a support function dates back to man's earliest instincts, being the very foundation of progress.

Historical data demonstrates that the "performer" has never been in danger of being relegated to the level of "draftsmen," rather than "engineers or designers" as Acpa fears, simply because his performance is evaluated. (One might be subject to termination or transfer, but that is another question).

Constructive Criticism

When performance is less than acceptable, it is the auditor's responsibility not merely to criticize, but to offer constructive solutions as well. The development of appropriate standards and procedures might be one approach. If indeed data processing has been "less than successful" in this area; as Acpa asserted, the DP audit profession would be among the first to encourage DP's assumption of this responsibility.

In conclusion, viewing the DP auditor as a competitor for the DP apple, if one eixts, is both incongruous and unproductive. The ability to recognize one's weaknesses as well as one's strengths is a sign of maturity.

Data processing has made significant strides toward the elimination of its "growing pains." Apparently Acpa would rather it eliminated "the competition."

Marino operates EDP Audit Services in West Hartford, Conn.

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Federal Agencies' Alibis Full of Holes

(Continued from Page 19)

from system design or cyclical reviews. Nor did it give any detailed reason as to why monitoring of agencies should be performed indirectly and voluntarily by the Office of Management and Budget (OMB) and GSA rather than being handled as a specific duty.

GSA did say its recommendation was based on the fact that "Admas are part of the broader universe of information systems development," but it didn't attempt to tie this to the reason.

I don't blame them. The whole point of the GAO reporting is reviewing, and it is not concerned with system development. The GSA alibi fell flat on its face by confusing the two.

Facing the Issues

HEW weighed in with the longest comment, some seven pages of it. Like GSA, HEW seemed to think review matters were development matters. At least, however, the writer came out and expressed his convictions here: "We would, however, place a greater emphasis than made by GAO on. . .the design and test stages rather than. . .the operational stage." HEW didn't give any rationale as to how correcting design and test faults eliminates the need for operational reviews, which is the subject of the whole report. But at least HEW said it, and said it clearly.

HEW's objection to independent reviewers also was not as badly disguised as those of the other agencies. It agreed with this recommendation and commented that: "Most importantly, the policy and guidelines should establish criteria for independent reviews."

However, nothing more was mentioned about from where this independence is to come. GAO's points about internal auditors and outside monitoring were all ignored in the HEW recommendations, as though they had never been written.

Instead it talked about development matters and only suggested someone "issue guidelines for management. . .including recommended practices and criteria for cost-effective. . .review and monitoring. . .by independent groups."

Well, HEW certainly had the best alibi, but it didn't address why we haven't had reviews in the past and why the agencies don't want independent reviews in the future, which is a pity because we would like to know.

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Wekome Mat Out at X3J1

WASHINGTON, D.C. – The PL/1 committee of the American National Standards Institute, X3J1, has completed its work on the full ANS PL/1 (which is now in the final approval process) and turned its attention to the requirements for standard subsets.

At a meeting here last month, the committee began drafting a "Scope and Program of Work" for two levels of the subset. One is for general-purpose use and the other will serve as a base for extensions appropriate to the real-time/process-control/communications environment, according to X3J1 Chairwoman Lois Frampton.

The committee welcomes the participation of parties interested in either of the above types of subset or in others which may be thought desirable, she added.

The next two meetings of X3J1 are scheduled for July 12-14, in Carmel Calif. and Aug. 25-27 in Boston.

Those interested in attending should contact Frampton at 5-5/E40, Digital Equipment Corp., 146 Main St., Maynard, Mass. 01734 or the local arrangements organizer for the Carmel meeting, D. Beech at M77/034, IBM Corp., 1501 California Ave., Palo Alto, Calif. 94304.

'Cosy' Generates Cobol Code From Decision Table Entries

NEW YORK – Fifty percent savings in coding and testing time, on the one hand, and "100% complete, fully structured Cobol," on the other, are the claims made for the Cobol Optimizing System (Cosy) by the vendor, C-S Computer Systems, Inc.

Developed for IBM DOS, OS and VS environments, the program generator has the ability to work from a free-form input language, from systems analyst's specifications keypunched into a predefined coding sheet or from decision tables, C-S said.

The input may be a mixture of Cosy statements and conventional Cobol source code. Statements that are already Cobol are passed through to the output file, the vendor noted. Cosy also allows the use of COPY facilities for both Cobol and Cosy routines from libraries, C-S added.

The decision table approach takes a little getting used to, the spokesman said, but has the added ability of determining that all logical paths are covered or that the user has a chance to supplement his initial input to cover all the alternatives.

Within the Cobol source code it generates, Cosy supports IBM's Vsam files, matching of up to nine files on nine different control fields and rolling of totals at control level breaks. Chained files such as those used by IBM's Dbomp and explicit addressing are also supported, the vendor said.

Created in Germany, the generator also supports a provision for stating a condition at any level so that if it is not true "the program automatically proceeds to the next equivalent level – without further instructions," C-S said.

In addition to producing Cobol source code, Cosy has the capability of producing data and application logic flow charts which could be useful both for debugging during program development and for maintenance work once the program is in production, the spokesman added.

Cosy is available now for a perpetual license fee of $18,500 or for rent at $1,500/mo, C-S said from 116 John St., New York, N.Y. 10038.

DOS Users Going to 370, VS and Non-IBM Software

By Don Leavitt
Of the CW Staff

MINNEAPOLIS – Installations operating under DOS are getting bigger, moving to IBM 370s and buying at least some software from non-IBM sources, according to the findings of a survey recently conducted by the Minnesota DOS Users Group.

Taken overall, those results aren't surprising, group president Chester L. Adkins said. But, he added, "one interesting fact is that the average 360/30 size is 106K bytes. By definition then; the average 360/30 in our sample uses non-IBM memory."

Continuing his mathematical analysis, Adkins said the average 360/40 is now 225K while the average 50 is nearly 435K bytes. He noted that each model tended on the average to be twice as large as the preceding one.

This year there were 145 responses to about 250 questionnaires mailed to installations across the country in January. The majority of replies – 84, or 60% – came from 370 shops, while 58, or 40%, said they use 360 gear.

Two responses came from IBM 3 users who are members of the group even though they can't use DOS or DOS/VS.

On another topic, the majority of the respondents said they use at least one non-IBM software package, including – for seven sites – Extended DOS (Edos) from the Computer Software Co. as the supervisor in place of IBM's control system. Only 42 sites reported they use no non-IBM software.

At the other extreme, 77 shops reported use of at least two independent packages. Seventeen of the users – nearly 20% of the total – have acquired half a dozen or more packages from non-IBM sources, the survey showed.

The installations that have gone to the 370 have generally converted to virtual storage environments as well; only four users reported sticking with "straight" DOS on these mainframes, Adkins said.

At least 45 of those who have gone to DOS/VS have configured their systems with five partitions, one of the advantages this operating system has over DOS, which can manage a maximum of three partitions.

The Minnesota DOS Users Group started in the late 1960s to support local users working with DOS/360. Now it has a nationwide mailing list.

Adkins is executive vice-president, Integrated Data Processing, Inc., Suite 111, 8120 Penn Ave. S., Bloomington, Minn. 55431.

Honeywell Eases Conversions From 200/2000s to Series 60

WALTHAM, Mass. – "Smooth transition from . . . 200/2000 to Series 60/Level 66 large computer systems without expensive program and file changes [is] facilitated by a hardware/software conversion package," CM 66, according to a recent Honeywell announcement.

Hardware and firmware components of the Compatibility Mode on the Level 66 package can be connected to any standard Level 66 configuration, Honeywell said. CM 66 enables users to run unmodified OS/2000 and Mod 1 programs and data on the newer machines, the spokesman added.

Everything But I/O

The system handles all 200/2000 instructions except I/O instructions which are executed through Level 66 hardware, he said, while the processor interface adapter of the microprocessor built into CM 66 accesses the standard Level 66 MOS memory

CM 66 does not require the Level 66 mainframe to be dedicated to compatibility. On the contrary, "other Gcos operating system dimensions, such as time-sharing, batch, remote job entry and transaction processing," can be handled right along with the work from the 200/2000.

Conversion to Level 66 native mode of operations, therefore, may be spaced out over time, in accordance with the availability and improved skills of the upgrading user's DP staff, the spokesman noted.

In any case, he added, CM 66 is to become available sometime this quarter on a one-year lease arrangement for $1,395/mo. Honeywell's inquiries center is at 200 Smith St., Waltham, Mass. 02154.

'DYL—260' Gains Freeze Option

ENCINO, Calif. – Release 3.0 of DYL-260, the report writer/data management system from Dylakor Software Systems, Inc., includes a "freeze option" which enables users to store compiled DYL-260 programs in object module format, according to the vendor.

Prior to the availability of this option, users could only work with DYL-260 in load-and-go operations. Now they can reuse code previously developed and checked out while introducing runtime variables to shape the program to production needs, a spokesman explained.

As an extension of the freeze option, users may also store DYL-260 Job Control Language (JCL) and runtime parameters on disk so only card data need come directly from the reader. Used to its fullest, the option should reduce runtimes and core storage, the firm said.

A "Data Name/Initialization" feature simplifies both field definition and data base linkages, the spokeswoman said. In previous releases, users had to work with fields defined by their relative positions in records and their lengths, but not by descriptive names, she added.

An "extended error analysis" feature monitors runtime problems and traces them back to the source statement being executed. Data areas, registers, current records and "all pertinent data" is formatted and displayed to reduce debugging time, Dylakor said.

Other enhancements include support for multiple inputs of a tape file dynamically specified; an extended parameter list capability for external subroutines; ASA carriage control for report generation; and stacker selection for card output.

DYL-260 is available for $8,000 purchase or $98/mo on lease. Discounts are offered on long-term leases, the firm said from 16255 Ventura Blvd., Encino, Calif. 91436.

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'Aide' Backs Transactions

DALLAS – The Advanced Interactive Data Entry Transaction Processing System (Aide/TPS) now available from Interactive Systems Technology (IST) is a general-purpose, minicomputer-based data entry system which provides data entry applications or terminal system emulation, according to IST.

The software runs on "any" Data General mapped mini and supports a multitasking foreground/background control structure.

Applications programs in batch mode are executed independently in the background while multiterminal interactive data entry and data base inquiry or update operate concurrently in the foreground, IST said.

Background programs may be written in any available language including Fortran, Algol, RPG, Cobol and Assembler. Control functions supported include Message Send, Broadcast, Text Editor and CLI Execute – which allows the Data General Command Line Interpreter (CLI) to be scheduled as a job to process normal CLI command streams entered from any terminal.

Aide/TPS comes with the Aide Format Control System, which reportedly includes a runtime library of format control, data entry and data formatting routines, a module containing Macro definitions for generating data entry formats, data formatting specifications and device control tables.

In addition, Aideform, a utility program, provides facilities to design, test and edit format definitions and automatically generate the descriptor language macros, eliminating the coding of formats, IST said.

Aide/TPS is available under license for $7,500 from IST at 4450 Sigma, Suite 135, Dallas, Texas 75240.

'TFM' Watches Tape Libraries, Lists Files by Volumes, Names

WOODLAND HILLS, Calif. – Tape File Management (TFM), a tape library system from Case, Wachter & Associates, Inc. (CWA), produces reports to ensure data security and provide inventory management of tape libraries for OS, VS and OS/DSO users, according to CWA.

TFM provides a report of active tapes cross-referenced by both volume serial number and data set name. Other reports include a list of tapes to be scratched, a scratch pool list, data on tapes to be cleaned and reports on usage by system, department or client as well as the necessary diagnostic edit-checking features, CWA said.

Developed during a DOS to OS conversion, TFM was designed to solve many of the tape management problems inherent with OS, keeping in mind that DOS and noncataloged tapes may need to be accounted for and maintained in a single library, the vendor said.

Because of the data set structure used for TFM and the manner in which the system was designed, several features constantly monitor and ensure data integrity and provide audit trails of all activity, CWA noted.

Tracing a scratched tape even after the retention period has expired in order to reinstate it into the active library can easily be done, for example, up until the time that tape is physically written over, a spokesman claimed.

Using IBM 2314, 3330 or 3340 disks, TFM runs in a 110K batch partition and minimizes the space needed for the tape library catalog, the firm said.

The system is available for $3,000 from CWA at Suite 243, 21243 Ventura Blvd., Woodland Hills, Calif. 91364.

'Comput-A-Charge' Set for HIS Users

CHERRY HILL, N.J. – Comput-A-Charge, the job-accounting and chargeback system from Value Computing Inc. (VCI), has been adapted for use on Honeywell Information Systems, Inc. (HIS) mainframes under either OS/2000 or Gcos, VCI said, adding both versions are available now.

The package provides a resource accounting and billing system to aid users in controlling the operational environment. Taking data directly from a log produced by the operating system, it produces a series of seven daily reports including graphs, VCI said.

The daily output shows shift activity, idle time and hardware usage. Comput-A-Charge also builds a year-to-date file from which weekly, monthly and yearly reports can be drawn, the vendor added.

Comput-A-Charge is said to provide a flexible algorithm for billing users. It can accommodate nonmachine resources, including the ability to account for and bill the costs of off-line functions such as systems analysis, programming, data entry and distribution, the vendor said.

The implementation for installations under Honeywell OS/2000 (releases 2.3 or 3.10) is available under license for $6,000. The Gcos version costs $9,000, the firm added from 300 VCI Building, West Marlton Pike, Cherry Hill, N.H. 08002.

Process Controller Gains Macro Assembler, Loader

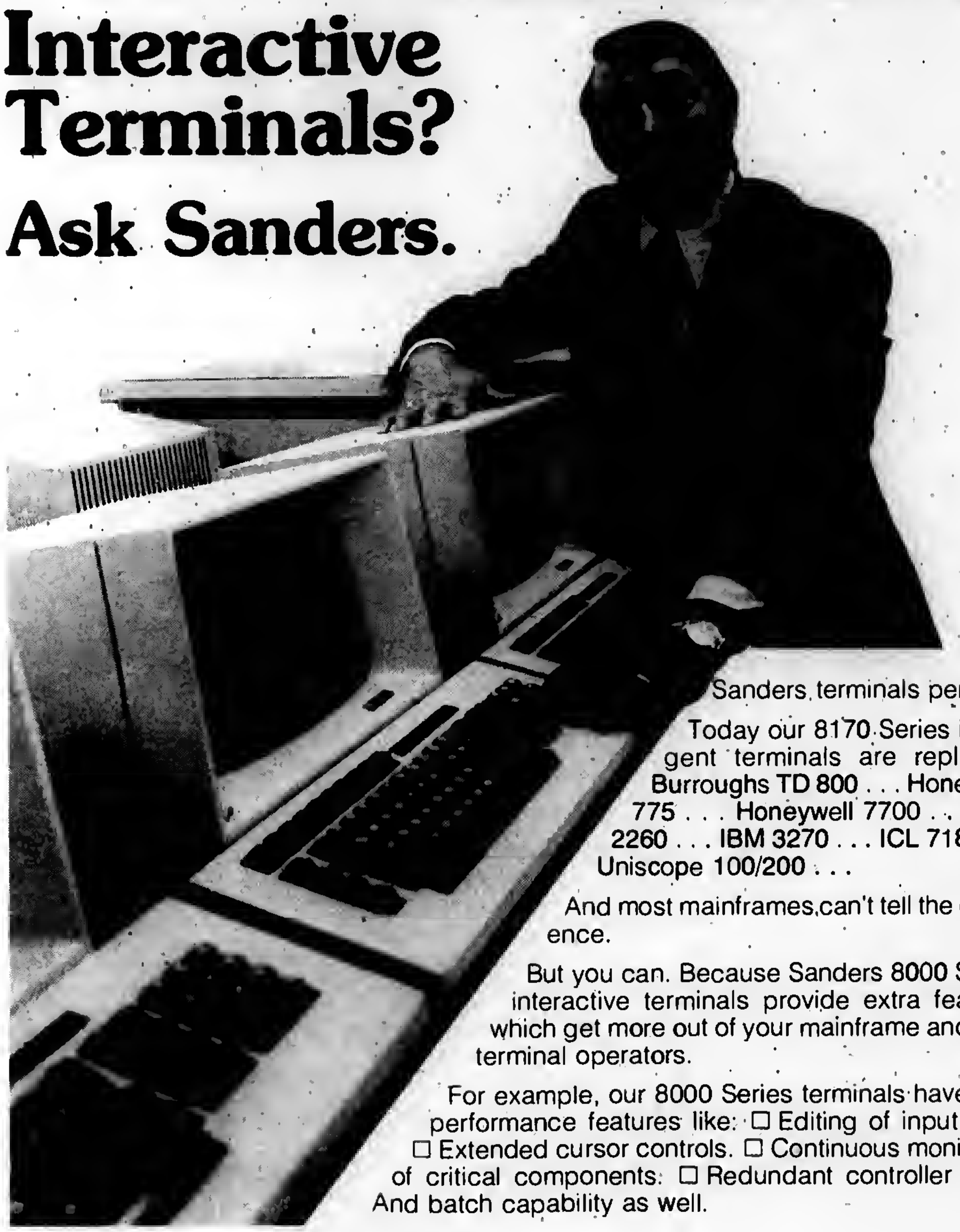
FLINT, Mich. – MAS-80R, a relocatable macro assembler, and RLL-80, a reloacting linking loader, are now available from Process Computer Systems, Inc. (PCS) for use on the firm's Micropac 80 microcomputer.

The software can combine separately assembled subprograms into a single functioning program, a spokesman said.

The packages eliminate the need to assign an absolute address to each subprogram at assembly time; entire programs therefore do not need to be reassembled in case of a change to a single module and the entire software development process is "substantially" reduced, he added.

Support for separately assembled subprograms has other potential benefits as well, the vendor said. MAS-80R and RLL-80 permit the use of identical symbols when they are local to their segments; Only global symbols must be unique, the spokesman noted.

MAS-80R and RLL-80 are being distributed by PCS as a set for $100. The company is at 5467 Hill 23 Drive, Flint, Mich. 48507.



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†T.M. Sanders Associates, Inc.

Video-Taped Training for 'Total' Extended to Include Release 7

MIAMI, Fla. – Eastern Airlines has updated the video-based training course it developed and now markets on the Total data base management system (DBMS) from Cincom Systems, Inc. to include three modules on Total Release 7, the current DOS implementation of the DBMS.

The course consists of 12 modules, each directed to a specific audience – DP management, systems analysts, programmers or others having a general interest in DBMS. It covers both the functions and use of all current IBM-oriented versions of Total.

The video-taped lessons range in viewing time from eight to 22 minutes, and actual Cobol programs are used whenever possible to illustrate specific points, an airline spokesman added.

The complete course, including the 12 modules and two copies of a reference manual, is available under license for $1,500. For users who already have the first nine modules or who require only training on Total 7, Modules 10 through 12 will be made available for a fee of $500, Eastern said.

All modules can be delivered in either cassettes or reel-to-reel 1/2-in. EIA-J1 format at no additional cost.

Marketing of the course is handled by Data Processing Sales, Eastern Airlines, Miami International Airport, Miami, Fla. 33148.

'Snapshot' of 3270 Screens

WHITE PLAINS, N.Y. – The IMS 3270 Local Copy program now available from IBM supports dynamic requests for hard-copy printout of screen displays on 3270 units attached locally to a large-scale IBM 370 mainframe.

Use of this Installed User Program (IUP), developed by Hamilton Standard Division, United Technologies Corp., is triggered by an operator entry at the 3277 keyboard. Once the program is invoked, an image of the screen display – input or output – is queued to the designated 3284 or 3286 printer.

Previously, local hard copy was obtained by including code in the application to send a duplicate of the outbound screen image to the printer.

Multiple 3270 display stations within the same line group are supported, but the buffer size of the destination printer must be equal to or larger than the buffer size of the display station to be copied, a spokesman noted.

Additional Information Management System (IMS) considerations – this program works only under IMS – include allowing at least 1,304 bytes for the long-message queue buffer and allowing an additional 3,100 bytes in the line buffer pool for each local group containing supported display stations.

IMS 3270 Local Copy supports components of the information display system which are accessed through Btam; Vtam support is not implemented in this IUP, the vendor said.

The program is written in Assembler and designed to run under IMS/VS 1.0 and 1.0.1. Testing has been done using OS/VS2 Release 1.7. The package is available under license for $190/mo, which is waived after 12 payments.

Compustat Data Base Now on Cyphernetics

ANN ARBOR, Mich. – Finance data on over 3,500 companies, expressed in more than 100 items of information about each, is included on the Compustat data base now available on the time-sharing services of Cyphernetics Division of ADP Network Services.

Developed and maintained weekly by Investor's Management Sciences, Compustat can be used to trace annual information for the past 20 years and quarterly detail for the past decade.

The data can be used to reconstruct balance sheets and income statements as well as other financial reports, Cyphernetics said.

The data itself can be accessed and analyzed through a range of programs in the Cyphernet library, including both conventional financial and time series analysis techniques and data base management systems.

Charting and more complex graphic output is also possible through Cyphernet facilities, the network said.

Cyphernet service is available in more than 40 major cities across the U.S. The network is headquartered at 175 Jackson Plaza, Ann Arbor, Mich. 48106.

Calcomp Disk Drives Monitored by 'DSO'

ANAHEIM, Calif. – A modified version of the Data Set Optimizer (DSO) package has been developed by Boole & Babbage, Inc. and is available from California Computer Products, Inc. (Calcomp) for use with Calcomp 1030 and 1035 disk storage systems on IBM 370s.

As with the package developed originally for IBM disk systems, the Calcomp DSO is designed to increase the user's control over disk volume and data organization and provides measurements of how frequently particular data sets are used, Calcomp said.

DSO generates a series of reports to document things such as location of data sets by pack, amount of movement between data set pairs and recommendations on how to regroup these data sets to gain efficiency. Regrouping may reduce head movement by 20% to 40% and minimize seek time so that throughput is "significantly reduced," the spokesman added.

Lease price for the Calcomp DSO – which can be used to monitor mixed IBM-Calcomp as well as "pure" Calcomp disk environments – is $300/mo, including maintenance. The package is available now, Calcomp said from 2411 W. La-Palme Ave., Anaheim, Calif. 92801.

Correction

Data Services Corp. of America, vendor of the Minidump package for IBM OS and OS/VS shops [CW, May 10], is at 1501 Wilson Blvd., Arlington, Va. 22209.

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Users Want Too Much From Hipo: Yourdon

By Edward G. Yourdon

Special to Computerworld

What's wrong with Hipo? Nothing.

Well, not very much. The major problem is the way people *use* Hipo.

But let's back up for a moment. What *is* Hipo?

Concepts and Techniques

It is a documentation technique developed by IBM to illustrate the hierarchy and structure of a large program or system. With the advent of structured design and programming, Hipo has received a great deal of attention. See, for example, "Hipo for Devcloping Specifications" by Martha Nyvall Jones in the March 1976 *Datamation.*

For more details on Hipo, which stands for "Hierarchy, plus Input, Process, Output," see the IBM manual *Hipo: A Design Aid and Documentation Technique*, Form GC20-1851-0.

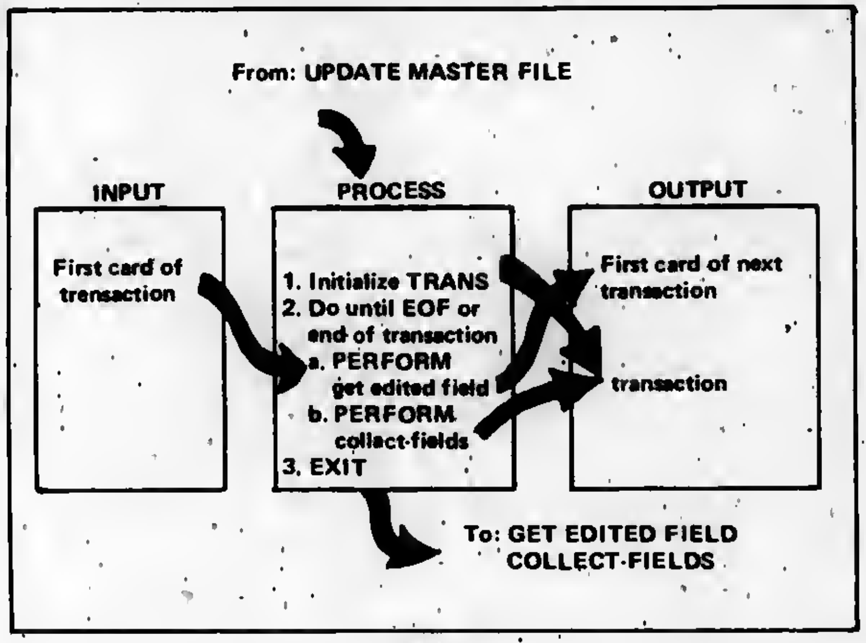
From: UPDATE MASTER FILE
INPUT
PROCESS
OUTPUT
First card of trensaction
1. Initialize TRANS
2. Do until EOF or end of transaction
a. PERFORM get edited field
b. PERFORM collect-fields
3. EXIT
First card of next transaction
transaction
To: GET EDITED FIELD COLLECT-FIELDS

Figure 2

Figure 1 shows a typical "hierarchy chart." Figure 2 shows a "detailed Hipo," or "functional Hipo," or "input-process-output diagram" for a single module.

And Figure 3 shows an alternative diagramming technqiue: a "structure chart," drawn according to the guidelines in *Structured Design* by Larry Constantine and myself. And there are other variations, too.

Hipo has some definite virtues. It represents a significant improvement for organizations that previously had *no* diagramming techniques with which to represent the architecture of their systems – i.e., Hipo is better than nothing.

Also, Hipo appeals to many managers and users (and analysts) because the hierarchy chart in Figure 1 looks like the company organization chart with which many people are familiar.

And – a point not to be ignored – Hipo has the support of IBM.

So, what's wrong with Hipo? I have only two technical complaints. First, common modules – things like a "print" module which is called from many different parts of a system – must be repeated in the hierarchy chart of Figure 1 each time it is used.

Second, the hierarchy chart in Figure 1 does not show the interfaces between modules. One must glean that information from the detailed diagram in Figure 2 or one must turn to a separate document, an "input-output table" which lists the inputs and outputs to each module.

My experience has been that the hierarchy chart in Figure 1 loses half its value if the input/output interfaces are not shown on the same diagram. The structure chart shown in Figure 3 takes longer to digest (and for that reason may not be a useful technique to show to users), but the information content is much higher.

Most of the problem, though, has to do with the misuse of Hipo.

Since people are not required to document the module interfaces on the hierarchy chart, some designers never document the interfaces at all! They select vague, ambiguous names for the modules in Figure 1 – names like "control" or "driver" or "do-it-all" instead of following the guideline of using a transitive verb and a single, nonplural object.

Also, the detailed diagram shown in Figure 1 is not kept up-to-date any more than detailed flowcharts were in "the good old days." So, while they may be useful as a design tool, they probably are *not* useful as a maintenance tool – because the maintenance programmer can't depend on their accuracy.

Perhaps the biggest problem of all, though, is that Hipo is treated as a panacea.

When I ask my students, friends and consulting clients, "Are you doing structured design in your organization?" many reply, "Sure! We're drawing Hipo diagrams like mad! You should *see* all of our Hipo diagrams! Fantastic!"

The obvious point is that drawing 10,000 Hipo diagrams does not guarantee you'll end up with a good system.

The title of IBM's manual says it all: Hipo is a design *aid* and a *documentation technique* – it's not design, in and of itself.

Yourdon is chairman of the board of Yourdon, Inc., New York, N.Y.

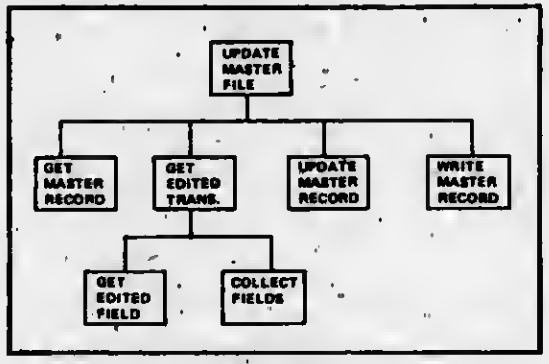

Figure 1

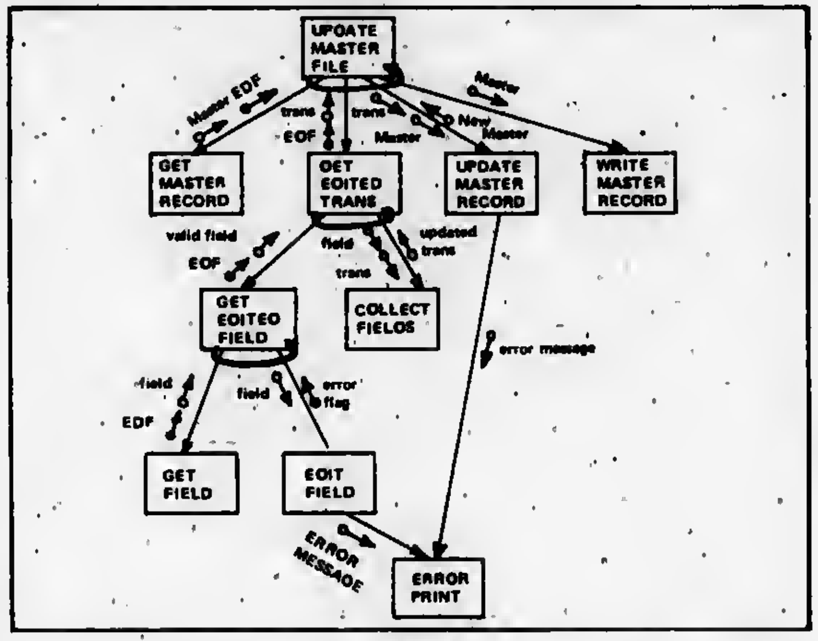

Figure 3

VM/370

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Trying New Techniques With Cobol Called Hopeless

By Tom McSloy

Special to Computerworld

Edward G. Nilges [CW, March 22] was only the latest of many to try to apply the disciplines of structured programming to that unwieldy mastodon, Cobol. His suggestions were more sensible than most, but he failed to demonstrate that Cobol can be used to develop true structured code.

Concepts and Techniques

Nilges correctly criticized the absurd lengths to which programmers must go to shoehorn Cobol into more structured forms, particularly the misuse of PERFORM ... UNTIL.

The concept of "virtually structured programming," as he outlined it, seems a sensible retreat from the hopeless attempt to blend Cobol and the Improved Programming Technologies (IPT).

Nilges included the word "structured" in his system's title as ritual obeisance to the popularity of the IPTs. What it really is, though, is simply the way good Cobol programmers have always programmed, long before they heard of Dijkstra or Harlan Mills.

His "virtually structured" example of the IF ... THEN ... ELSE block used to be called "cascade" logic: program flow ripples down through the code, "cascading" over sections of it, based upon the judicious use of IFs and GOTOs.

No Magic to It

The system Nilges described is altogether the best way to program in Cobol; easiest to debug, to maintain and to understand. It is much superior to faddish language constructs like PERFORM ... UNTIL, tacked on as an afterthought to Cobol's thick hide.

After all, there is nothing magic about structured programming. Mills and others simply discovered what it was that good programmers did and developed disciplines to make it easier for all programmers to write that way.

Had Nilges' article been entitled "A Better Way to Write in Cobol," I could only have applauded. However, he seemed to be also saying that his "virtually structured programming" examples can be substituted conceptually for the main building blocks of true structured code.

His evidence for this consisted of pseudocode examples which accomplish more or less the same functions as IF ... THEN ... ELSE and DO WHILE – though they use GOTOs – and observations of generated object code which contains GOTOs.

Nilges missed the point.

Languages such as PL/I have, built into them, the syntactical elements necessary to write true structured code. This is not to say that unstructured PL/I programs cannot be written; to write one, however, the programmer must swim against the natural flow of the language.

In Cobol, he may at least attempt to write structured code, but in doing so, he is bucking the natural tendency of *that* language, which imposes arbitrary restraints (e.g., reserved words, and the four DIVISIONs) but is, in the main, unstructured to its very core.

The idea of structured programming is to make it easier to write readable, maintainable, relatively error-free programs. It assumes the existence of language constructs necessary to accomplish this. Most of these are absent from Cobol.

Didn't Mention Limitations

Finally, Nilges failed to mention many Cobol limitations which thwart the most well-meaning efforts to implement top-down design and structured programming in that language:

- In Cobol, all data is known globally to all code. Functional independence and isolation of data, one of the key elements in top-down design, is therefore impossible.
- Given the inadequate language support for certain common programming functions, Cobol programmers must get tricky, which seriously affects the clarity of the code. In Cobol, one must treat strings as single-character arrays, for example, if one wishes to isolate substrings within them.

Another example involves having to code something like this:

```
02 HALFWORO PIC S9(4) COMP VALUE
   +128.
02 FILLER REOEFINES HALFWORO.
   03 FILLER PIC X.
   03 HEX-80 PIC X.
```

before a field can be tested for a hex "80."

- The absence of POINTER variables and of the ADDR function makes Cobol very cumbersome in on-line, real-time or data base systems where the actual location of data is not known until execution time.
- It is often difficult to isolate data paths among Cobol modules not only because of globally known data, but because there is no support in Cobol for parameter passing between, say, SECTIONs of a Cobol program, as can be done between PL/I internal procedures.
- The lack of such disciplined constructa as IF ... THEN DO ... ELSE DO and Cobol's sensitivity to periods creates bugs which look perfectly logical at a glance.

This is a violation of the bug-free objectives of structured programming, particularly when one considers that not all such bugs will be caught by the compiler, as in the following example:

```
IF condition-1
   THEN
      MOVE A TO B.
      AOO X TO Y.
      COMPUTE SQRT=SQRT**2
```

Do you see the bugs? Probably not right away. A common error in Cobol is to put periods after statements within IF ... THEN blocks, where they don't belong.

It is possible to have bugs in any language, of course, but Cobol makes it easy to make such mistakes. The same logic, written in PL/I, could not contain this sort of error because of PL/I's syntactic discipline:

```
IF condition-1
   THEN DO;
      B=A;
      Y=Y+X;
      SQRT=X**2;
   ENO;
```

- The lack of a Cobol macro processor to add user-written verbs or to enforce installation standards is widely recognized. PL/I, of course, has this facility built into the language, though its implementation could be improved.

McSloy is an independent consultant with McSloy & Associates, Chicago.

"Why MARK IV? Twice the productivity with no increase in staff."

By Jim Harder
Manager, Technical Planning and Development
Boise Cascade Corporation

"Within the past two years we were able to support twice as much development activity without a staff increase, largely due to MARK IV.

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"With MARK IV you get a lot of work done both easily and quickly. We recently converted a chain file maintenance system – an antiquated IBM bill of materials access method – to DL/1. MARK IV reduced what would have been a major project in Cobol to nothing more than a slight change in file definition. With MARK IV's independence of files and access methods, we were home practically free – we did the job in a day.

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Remedies Exist for 'Dehumanized' Training Program

By Jack L. Stone
And Alexander P. Grant
Special to Computerworld

Humanization of the work place should be a major objective of computer center managers at all levels.

This requires, among other things, that management demonstrate a sincere interest in the personal development of computer center people. One significant area in which management can demonstrate such interest is the training process.

However, most computer center managers report that training programs, where they exist at all, are largely ad hoc efforts implemented on a crash basis to meet a crisis need.

Also, primary in-house training capabilities are frequently confined to stand-alone audio/visual packages despite the general acknowledgement that they are not effective unless supported by an experienced instructor.

Another problem is that personnel are often required to attend training courses entirely or partly on their own time; i.e., workloads are not adjusted to provide adequate time for training.

The amount of training offered computer center personnel seldom exceeds one or two days a year. In most installations, an average of 10 days of formal training per year per person would be more cost-effective.

Peopleware

One important element of a sensible, cost-effective, long-range personnel development program is carefully planned, continuing training based on the needs and aspirations of the people acting as thinking beings rather than as interchangeable parts of a machine system.

Until humanistic management prevails, personnel motivation, initiative and productivity will continue at unsatisfactory levels.

Computer center managers should not complacently think that personnel relations are in good shape because of the low turnover rates that have become common in recent years. It is more likely that the economic recession rather than newly found love for management and organization is the causative factor in low personnel turnover.

Moreover, personnel frustration levels have increased during the past several years. If this is true, we may reasonably expect a rapid increase in turnover as the economy improves.

Minimizing Turnover Possible

However; we believe managers can minimize this projected trend and maintain or increase productivity. One of the approaches for production people useful in attaining such objectives is to use a live instructor to conduct training courses.

For most people, learning from "machines" alone, whether programmed instruction (PI) texts, computer-aided instruction (CAI) or audio/visual packages, is dull, tedious and unprofitable. For some, it can be dehumanizing and counterproductive.

Another approach is to support the instructor with commercially available curriculum materials. Experienced instructors can adapt such stock materials to serve the specific needs of the individual computer center.

Also, the instructor should be given time to give individual attention to students outside regular class hours. Computer center people come from a wide variety of backgrounds and, therefore, have widely varying learning capabilities and needs.

This is one in a series of articles by these authors. In this article, Stone and Grant outline specific means of "humanizing" the training process. In the next, they will discuss the possibilities of unionism in the DP environment.

Students should be required to use current hardware/software technical reference manuals during workshop sessions in class and homework assignments. This action helps overcome their initial reluctance to use the manuals.

Frequent Quizzes

It also helps to provide quizzes frequently in the classroom, but do not collect quiz grades. Let each student correct his own quiz.

Quizzes should be fairly easy in the beginning. Let the students obtain immediate success experiences early in the training program.

It is important to announce and administer written mid-course and final examinations. These examinations assist in motivating the student and establishing an acceptable level of in-class and homework performance.

Also assure that each instructor engages in extensive Interactive dialogues with the students. Interactive discussion tends to promote the attitude that training is a cooperative effort by the instructor and the students.

Another training technique is to organize the students into small teams for laboratories or workshops. Assign the more experienced or capable students as team leaders. Such assignments are productive both for the team leaders who learn by teaching and for the team members.

Reviews Helpful

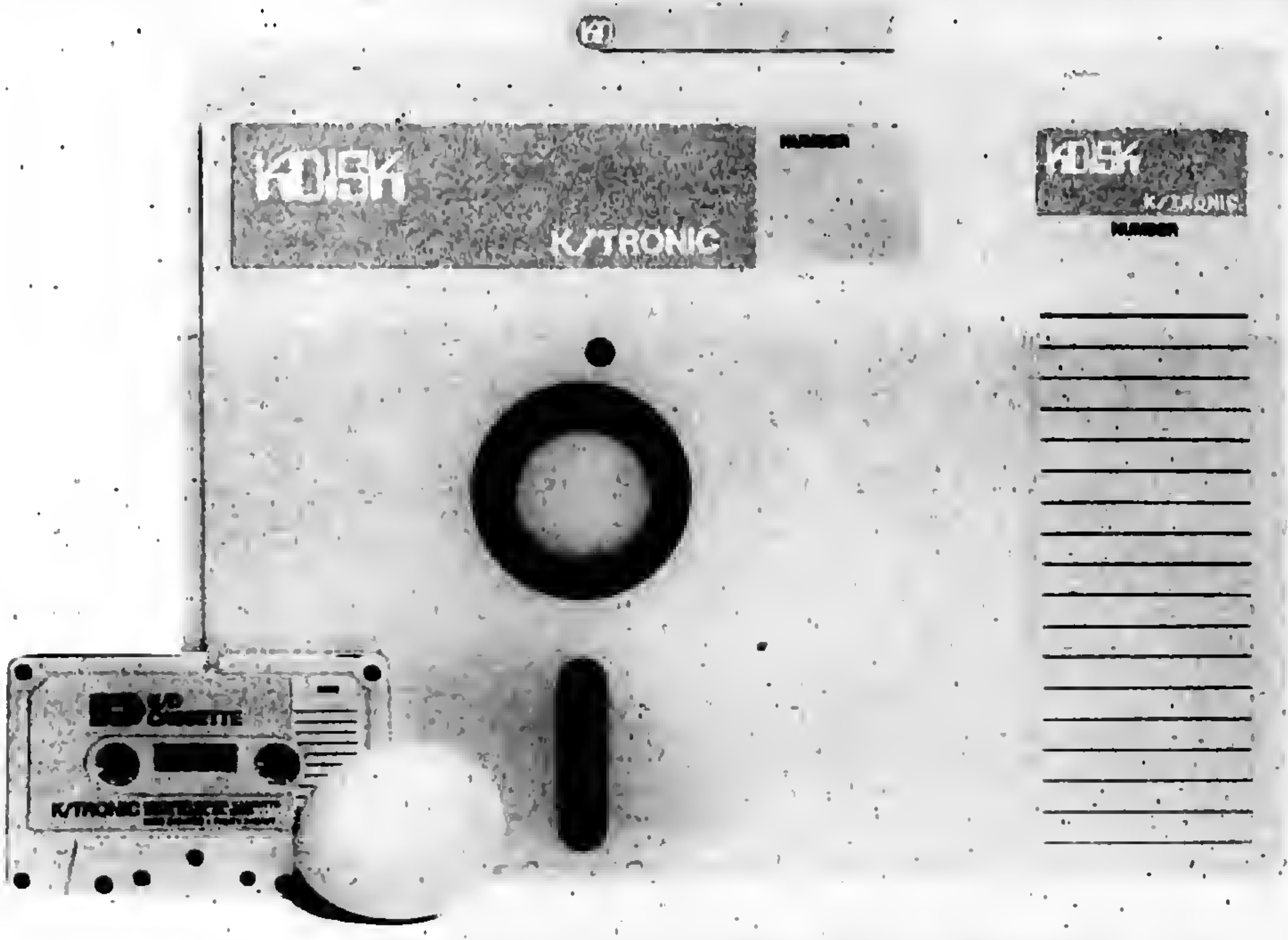
Conducting brief reviews at the beginning and end of each class session helps the student to "put the pieces together" and promotes retention of learning.

It also helps to emphasize concepts during classroom presentations, to build a broad understanding of systems, flows, functions and processes. This strategy is more productive, in both the short and long range, than presentation of masses of technical details.

It is also important to build interest in the student for follow-on self-development and professional growth. Establish and make known knowledge and skills requirements for desirable assignments and promotions.

Have a key manager or executive start each major training program with remarks expressing management Interest in the growth and development of personnel. Have another executive present graduation certificates at the conclusion of each course.

Stone is the managing editor and Grant a senior associate of Computer Education International, Inc. of Washington, D.C.



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Includes Two Nationwide Services

ITT Switched Common Carrier Network on the Boards

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – International Telephone and Telegraph Corp. (ITT) has filed an application with the Federal Communications Commission (FCC) to offer a switched nationwide common carrier network that would serve data and other users.

The two services, slated to begin in 1978 by ITT Corporate Communication Services, Inc., will be a switched private network service (SPNS) and a corporate communications switching equipment (CCSE) offering.

Under SPNS, users will get four-wire switched facilities on a subscriber-to-subscriber basis. The SPNS user will have dedicated access lines between his location and the ITT switching center, but the facilities between switching centers will be shared with other users of the service, the company said.

Service features planned under SPNS include privacy, per-call billing and traffic data. Proposed rates for SPNS filed with the application to the FCC show a suggested local access charge of $30/mo per channel with an $85 one-time installation charge. Usage charge per port will be a minimum of $120/mo.

Beyond the minimum rate, eight categories based on distance and time the network is used will apply. These will range from 3 cent/min from 1 to 400 miles up to 39 cent/min at distances over 2,500 miles.

The SPNS offering will have 1 min minimum call time with additional time billed in 6 sec increments.

The second service, CCSE, will provide the user only with access to the switching equipment. It will require that a large user contract for the use of a minimum of 96 ports; billing will be based on a flat charge of $120/mo per port plus a one-time installation fee of $60 per port.

Under CCSE, users will have responsibility for providing the lines between switching centers; these networks will be customized in nature. Users will be able to utilize their own processors on a CCSE network, an ITT spokesman said.

Although this service will use the same switching centers as SPNS, FCC approval is not required for the CCSE offering, he said, adding ITT will be its first customer.

Seven switching centers will be constructed in New York City; Memphis, Tenn; Atlanta; Cleveland; Chicago; Dallas; and Los Angeles. Later "tariff-extension" cities will include Boston; Newark, N.J.; Philadelphia; Baltimore; Washington, D.C.; Milwaukee; Gary, Ind.; Houston; San Francisco; and San Diego.

Other ITT Services

ITT also has other specialized carrier services that include the U.S. Transmission Systems network, which recently began operations between New York and Washington, D.C. This network provides users with conventional voice-grade lines.

Another ITT subsidiary, Domestic Transmission Systems, has filed with the FCC to offer a packet-switched store-and-forward network called Com/Pak beginning operations in 1977. This plan is currently pending before the FCC.

In a related announcement, ITT World Communications announced it plans to interconnect its overseas facilities with the Graphnet specialized carrier network operated in the U.S. by Graphnet Systems, Inc., for facsimile and data users.

TRW Has 'New Generation' POS System

LOS ANGELES – Described as a "new generation" point-of-sale (POS) system, the 2001 from TRW, Inc. will reportedly make it possible for department stores to reflect their individual operating styles while increasing sales-counter efficiency.

The 2001 was designed to offer the user full interactivity and programmability, TRW said. It electronically enforces transaction policies and procedures, audits sales and collects sales information for financial and merchandising applications.

On the sales floor, for example, the acceptance of charges, checks and gift certificates can be varied by department, the firm said.

The retailer can record multiple forms of payment and combinations of payments and authorize each depending on his operating procedures.

The 2001 capabilities include displaying operator prompting and promotional messages on a programmable video display; performing complex calculations through its microprocessor-based programmable POS terminal; and communicating POS information through a real-time systems architecture, TRW said.

This architecture combines high-level software, distributed processing, modular expandability and what TRW called "selective redundancy."

The 2001 system features a 9-in. video display which rotates on a 40° axis on top of the terminal, primarily intended for operator prompting and error checking.

The display also permits inquiry and data entry capabilities in real-time applications such as big-ticket inventory, credit and check authorization. Between transactions the unit can display promotional messages informing customers of upcoming sales and sales in progress; it can also be used for security alerts, TRW noted.

Hardware for the 2001 system consists of three basic elements:

- A store-level minicomputer which supports up to 128 terminals, collects data and communicates with external data bases.
- A microprocessor-based terminal support module which provides backup for terminal support and data collection from up to 30 terminals and handles terminal support in satellite stores.
- A POS CRT terminal that offers full stand-alone capability on the sales floor. The terminal stores in memory the logic to perform complex calculations as well as tax tables, discount schedules and delivery information for lookup.

All functions of the system are software-directed, with programs written in a high-level language called PLT 1, TRW's enhanced version of PL/1.

The price of the 2001 POS terminal is $3,975. The cost of a basic backroom, store-level system including standard report and operating software starts at $48,000, according to the company. Initial deliveries are expected to begin in the third quarter.

Customer services for the system will be handled by TRW's network of service centers located throughout the U.S. and Canada.

Tran M3200 Pacuit Backs Network Builders

EL SEGUNDO, Calif. – A network management and switching system introduced by Computer Transmission Corp. (Tran) offers the combination of packet and circuit switching to builders of common carrier or private digital data networks for the first time, Tran said.

The M3200 Pacuit network management and switching system incorporates microprocessing hardware. This enables users to communicate with each other from remote terminals and with a central computer in a concurrent synchronous mode to facilitate network operation, Tran said.

The system permits the user to immediately access any available port with automatic cut-through for busy connections at the network manager's discretion, a Tran spokesman added.

It limits error requirements and supports most varieties of terminals now in use because it deals with them transparently, he said.

The M3200 Pacuit runs under a real-time operating program, the Data Switch Operating System (DSOS). Like the system hardware, DSOS is modular in structure, Tran said.

The functional and I/O facilities required by each switch in the network are defined through a system generation process which allows for a tailored version of DSOS for each switch, according to the company.

The system product line is based on the use of a bus structure that allows plug-in modules to be attached to it. Diagnostic modules can be added to the multiplexer for "extensive troubleshooting," Tran said.

The heart of the network management system is the network control center which provides real-time network monitoring, on-line network diagnostics, billing data collection and data switch down-line loading, the vendor said.

A utility mode for nontransparent network functions, a multiplexer for both synchronous and asynchronous traffic, a Teletype console support and high-speed trunk interfaces for internode connections are included, as is a port expander module for interfacing a high-speed synchronous multiplexed data stream directly to a computer, the company said.

The M3200 Pacuit carries a base price of about $50,000 for a "typical switch location" including the minicomputer, microprocessors and several interfaces, the spokesman said.

The cost, however, depends upon the complexity of the network; the system can grow from a few channels to one supporting nodes in many cities, providing several classes of service to a large number of terminal and computer resource channels in a shared-user environment, he noted.

Tran is located at 2352 Utah Ave. in El Segundo, Calif. 90245.

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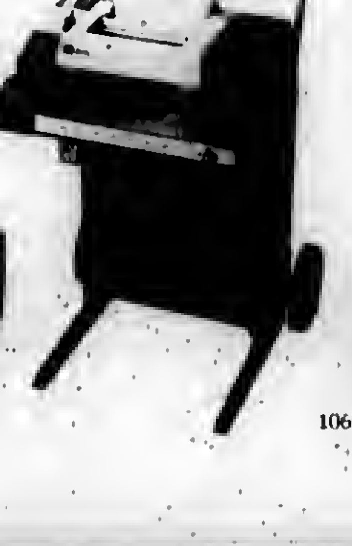

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Hand-Held Order Entry Terminal Has Micro, Communications

LOS ANGELES – A hand-held order entry terminal with communications capability for use in commercial retail applications has been brought out by Bergen Brunswig Corp.

The company's Ultraphasc terminal incorporates a microcomputer module and memory pack and a series modulc for transmitting information aftcr optical scanning of 6- and 12-digit Universal Product Code (UPC) labels, it said.

The 26-oz. terminal has an intcgrated optical probe for scanning UPC-A and UPC-E black and white or color bar codes in either direction.

It also features a LED display of the UPC plus three digits for quantities and one digit for the status codc.

In addition, the Ultraphase incorporates a 16-key numeric and function English keyboard, the company said.

The microcomputer module works with two 4K-byte memory packs which can store up to 800 line items and is said to be easily upgraded to provide greater storage or added functional capabilities.

Data transmission is accomplished through a built-in acoustic coupler in the service module or through a Bell Data Access Arrangement (DAA) through an optional DAA cable, Bergen Brunswig said.

The service module transmits up to 800 lines of order entry information storcd in the memory pack over voice-grade telephone lines at 1,200 bit/sec, it said.

When the probe is used to enter a product code, the code appears on the top linc of the LED display. Positioning of the code number is controlled by the microprocessor, thc company said.

Thc Ultraphase's price of $2,950 includes the microcomputer module, two 4K-byte memory packs.

Bergcn Brunswig is located at 1900 Ave. of the Stars, Los Angeles, Calif. 90067.

Sanders Graphic 5 Intelligent System Capable of Remote, Local Operations

NASHUA – An intelligent interactive graphics terminal display system has been introduced by Sanders Associates, Inc.

The system reportedly is capable of being connected directly to a computer that has a standard telecommunications or terminal port and can operate in local or remote mode.

The Sanders Graphic 5 system eliminates the need for complex interface software and enables the user to concentrate on specific applications programs, the firm said.

The basic system consists of a terminal controller, 21-in. CRT display and input devices such as keyboard, light pen and trackball.

A read-only memory (ROM) in the controller contains a stored program that handles communications between the terminal and host computer, controls the data entry devices, maintains and controls the display image refresh and performs other tasks usually done in the host computer, Sanders said.

The Graphic 5 system, which features built-in self-test and diagnostics, contains an 8K-word, 16-bit refresh memory expandable to 24K words.

An optional Fortran callable graphic subroutine package (GSS-3) enables applications programs to be written in Fortran, Sanders noted.

The system features standard serial interfaces that are plug-to-plug compatible with host communication ports. A generalized parallel interface is available for local installations.

The Graphic 5 basic system is priced at $38,700 from Sanders at Daniel Webster Highway South, Nashua, N.H. 03060.

CNCP Making Packet-Switched Net Compatible With CCITT's X-25

MONTREAL – The packet-switched Infoswitch network being implemented by Canadian National Canadian Pacific (CNCP) Telecommunications will be compatible with the X-25 recommendation of the Consultative Committee on International Telephone and Telegraph (CCITT).

This was one of the points brought out by F.G. Carleton, CNCP Infoswitch project manager, in a recent speech at the national conference of the Data Processing Management Association here.

For synchronous operation, Infoswitch will initially use the Higher Levcl Data Link Control (HDLC) subset included in the X-25 recommendation. It will also utilize a subset of Synchronous Data Link Control (SDLC) and a subset of Binary Synchronous Communications (BSC), Carleton said.

Since the final version of these protocols "is not certain, we are structuring to allow more versions each of HDLC and SDLC," he said.

Flow Control Procedure

To control the flow of data to and from the packet mode within the Infoswitch network, a flow control procedure is being implemented, he said. The X-25 recommendation includes a flow control procedure recommended by CNCP and the Trans Canada Telephone System (TCTS).

In order to allow public access from packet-switched and circuit-switched networks to existing private line nets, compatibility must be provided, Carleton noted.

This means carriers must maintain simple procedures that deal with the establishment of a connection; in this area, CNCP does not agree with thc network plans of TCTS, he said,

Using the Infoswitch approach, call establishment procedures remain the same and completely flexible customer networks are feasible. Since this is not possible with the X-25 recommendation, CNCP therefore "has a major disagreement with TCTS in this area," Carleton said.

'Collisions' Countered

Another area of disagreement between CNCP and TCTS relates to the traditional carrier network functions over the customer's interface and into his equipment. The X-25 recommendation requires the customer to select a path (logical channel) to the network at call set-up request time.

Since the network selects the logical channel for incoming calls and can simultaneously select the same channel as that chosen by the user, the terminal must deal with the problem of "call collision," he said.

Call collision logic exists in all networks, but heretofore has not been required in the customer's equipment. CNCP's major interface will not have this problem, Carleton said.

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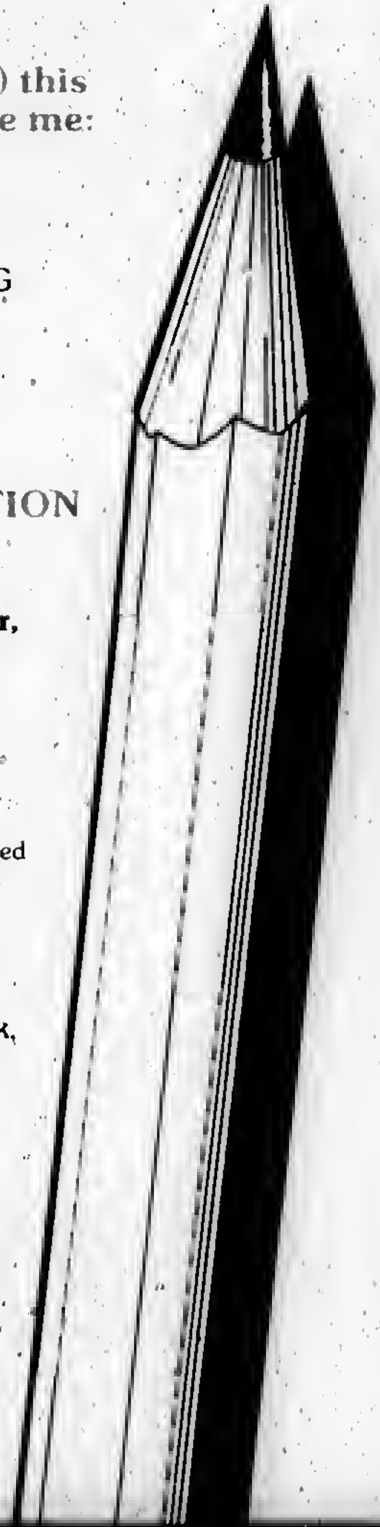

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Works With Model 279

NCR Has Bank Posting System

DAYTON, Ohio – NCR Corp. has a microcomputer-based passbook posting system, which it said operates with the NCR 279 financial terminal.

The NCR 279 Passbook Posting System combines the features of the company's Model 279 terminal with another product introduction, the NCR 2564 passbook printer.

The system provides commercial banks and thrift institutions with the ability to handle passbook savings transactions and cashed check listings in an off-line mode at the teller station, NCR said.

Terminal Transactions

Later versions of the system will feature on-line processing to a CPU, a spokesman added.

Application software for the system is stored in up to 64K of random-access memory (RAM) in the NCR 2200 microcomputer, which provides in-house control for the terminals and passbook printers, the company said.

The system also includes the NCR 2501 interactive module controller with 1K of read-only memory (ROM) and 8K of RAM. The 2501 is a freestanding microprocessor-based controller which NCR said links up to four printers to the micro.

Each printer can serve up to four 279 teller terminals; the system can handle a combination of up to 24 NCR 279 terminals and interactive module controllers, NCR said.

In a typical savings deposit transaction, data is entered into the 279 terminal at the teller station. The savings passbook is then inserted into the printer and the passbook updated under the control of the microprocessor, it said.

The price of the 48K microcomputer is $10,020 or $375/mo. The interactive module controller is priced at $1,500 or $75/mo; the passbook printer sells for $3,200 or $120/mo.

Prices for the NCR 279 terminal begin at $2,600. There is a one-time software installation charge of $400 and a monthly license fee of $35.

A typical 12-teller operation costs approximately $4,500 per station on a purchase basis, NCR said.

Deliveries of the system are scheduled for the third quarter, the company added from Dayton, Ohio 45479.

Telcon Introduces Bell-Type Modems

FT. LAUDERDALE, Fla. – Telcon Industries, Inc. has developed a line of 300-, 1,200- and 2,400 bit/sec Bell-compatible modems for stand-alone, central office, rack and OEM configuration.

The modems are designed on single PC cards which can either be plugged into a stand-alone data set or into a standard Telcon TFX-20 rack, the company said.

The 1200 is also available in another version, the TDM 1200, which is plug- and software-compatible with Digital Equipment Corp's PDP-8 and PDP-11, Telcon said.

The price of the basic 1200 is $365, and the TDM 1200 is $795, The 300 costs $345 and the 2400 is also priced at $795.

Delivery is four to six weeks, Telcon said from Ft. Lauderdale, Fla. 33315.

IMR-80 Readers Enhanced

PASADENA, Calif. – Bell & Howell's Business Data Products Division has introduced a binary synchronous communications enhancement for its IMR-80 series of intelligent optical mark readers.

The communications capability permits users with IBM host computers to enter edited optical mark data using binary synchronous communications emulating remote batch terminals such as the IBM 2780.

A basic IMR-80 bisynchronous system is an integral package consisting of the IMR-80 microcomputer and its associated I/O electronics, a 300 card/min card transport, a modem control interface for switch-selectable synchronous or asynchronous communications, a control panel and a power supply.

The basic unit is available on a lease basis for as little as $322/mo from 360 Sierra Madre Villa, Pasadena, Calif. 91107.

IBM Adds POS Units

WHITE PLAINS, N.Y. – IBM has added two terminal models to its 3600 financial point-of-sale (POS) system. The terminals, designated 3606 and 3608 models 2, provide plastic-card transaction services at small retail stores.

With the terminals, financial institutions can enable retail outlets such as clothing boutiques and restaurants, which require only a single point-of-sale device, to authorize consumer bank card or personal check transactions, IBM said.

To handle a credit card purchase at a clothing store, for example, the clerk passes the customer's card through the terminal's magnetic stripe reader and keys in the purchase amount.

Using the terminals, users can obtain validation of a cash card or guarantee a check. Additionally, banks, savings-and-loan associations and credit unions can use the terminals to transfer transaction funds directly from a shopper's to a merchant's account, the vendor said.

The devices can be linked directly – without an attachment unit – to a private communication line, according to the company. The line connects the terminals to a central mainframe via a communications controller.

The 3608 features the same capabilities as the 3606, plus an alphanumeric printer which can provide a sales receipt and other documents.

The 3606 and 3608 models 2 may be purchased for $1,125 and $2,225, respectively. They also are available under IBM's Alternative Term Plan, which provides for a 60-month contract period, for monthly charges of $39 and $72. First customer shipments are scheduled to begin early next year, IBM said.

The Silent 700 ASR Data Terminal. It shares time with good company.

The twin-cassette *Silent 700*® Model 733 ASR data terminal from Texas Instruments is supported by every leading U.S. timesharing service company, a few of which are indicated here.

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Datashare Gets Net Facility

SAN ANTONIO, Texas – Datapoint Corp. has added a network facillty to its Datashare terminal system which it said permits a CPU to access and process data stored in remotely located files.

With this facility, called DS3NET, a central Datashare system can communicate with remote Datapoint processors and handle processing tasks that require data stored at the remote locations, according to the firm.

The addition of this feature means data gathered in field-located intelligent terminals or remote processors can be used in the generation of home-office reports without transferring the complete files to the host CPU.

The CPU can use the remote files with all the facilities, access methods and programming ease that would be available if the files were local, the firm said.

In a typical operation, when daily data entry and preprocessing activitles have been completed at the field location, the remote system automatically dials the CPU using standard telephone lines.

The DS3NET network facility enables the remote installation to effectively become an extension of the host system, Datapoint said. The central system can use the remote printer located at the field site, for example, to print the results of its processing operation.

The DS3NET software facility can. be incorporated into existing Datashare configurations by loading the contents of a cassette into the system.

The capability costs $15 plus a small fee for documentation. It is available now from 9725 Datapoint Drive, San Antonio, Texas 78284.

Data Entered on CRTs

NCR Inn-Tact Hotel System Bows

DAYTON, Ohio – A reservations and guest accounting terminal system for 200- to 700-room hotels has been introduced by NCR Corp.

The turnkey system ls called NCR Innkeeping Travel Accommodations Computer Technique (Inn-Tact). It includes the microprocessor-based NCR 7797 terminal processor, disk storage devices, and desktop matrix printers capable of printing up to 165 char./sec, NCR said.

All data is entered by hotel employees through 7797 CRT terminals. A format appears on the screen and the employee supplies the information needed by filling in the blanks.

The information is then stored on the magnetic disk and can be retrieved when needed. Should a hard copy of the information be required – for example, to produce a guest bill – the printer duplicates the information on the CRT screen.

The terminal-based system provides a variety of reservations, billing and revenue reports. For example, listings can be produced each night showing next-day arrivals, type of lodging required, length of stay and other information needed for planning by hotel personnel.

A preregistration card can be prepared in advance so the guest validates the information on arrival rather than filling out a complete form. Guest bills, accounts receivable reports, aging reports and revenue reports are produced automatically, NCR said.

The rental cost of the system for a 250-room operation averages less than $10 per room/mo, the firm said.

The integrated system can include up to four NCR 7797 terminal processors, up to two disk units with combined storage capacity of 18.6M bytes and up to four matrix printers. The separate reservations system and/or guest accounting system can each be configured to include the same.

Terminal Transactions

Prentice Announces Multiplexer Models

PALO ALTO, Calif. – A line of multiplexers designed to enable several terminals to use a single leased line are available from Prentice Corp.

Designated the M series of the firm's frequency division multiplexers (FDM), the units can operate over standard 3002 voice-grade lines and carry data at rates of from 75 bit/sec to 1,200 bit/sec, Prentice said.

Over conditioned voice-grade lines, the M series can multiply up to 25 75 bit/sec terminals or combinations of data and voice over the same line, the company added.

The modules consist of two printed circuit boards – the channel receiver and the channel transmitter and control. They are designed to plug into all existing Prentice housings and have built-in diagnostics and LED indicators, the company said.

The M series can interface with RS-232- and CCITT-compatible terminals and can operate with terminals requiring the 20 Ma loop interface, Prentice said. Other interfaces are available.

The price is $545 for a stand-alone unit and individual modules start at $465. Prentice can be contacted at 795 San Antonio Road, Palo Alto, Calif. 94303.

BR Adds 5-In. CRT To Series 2200 Line

TRUMBULL, Conn. – Bunker Ramo Corp.'s (BR) Information Systems Division has added a 5-in. CRT data terminal to its Series 2200 line.

The Model 90/11A displays up to 480 alphanumeric characters and has a block-style keyboard which includes an 11-key numeric keypad, 12 function keys, nine edit and control keys and six special symbol keys.

It measures 11 in. wide by 16 in. deep by 5-7/8 in. high and weighs 17 lbs.

The 90/11A operates through a BR Series 2200 control unit which will communicate with on-line host CPUs, the firm said.

The price of the 90/11A is $950 and delivery is 90 days from 35 Nutmeg Drive, Trumbull, Conn. 06609.

Sperry's Lyet to Give Keynote

Four Special Plenary Sessions to Highlight NCC '76

NEW YORK – The 1976 National Computer Conference (NCC) will open on Monday, June 7 with a keynote address by J. Paul Lyet, chairman and chief executive officer of Sperry Rand Corp.

Lyet plans in his speech to explore the challenges facing the computer industry in the future, according to the American Federation of Information Processing Societies, Inc. (Afips), the conference's sponsor.

Also addressing NCC will be Dr. Anthony Ralston, president of Afips, at a special plenary session on June 8. Focusing on computer sciences and information processing, Ralston will discuss the prerogatives, duties and obligations of the scientist and technologist.

The role and responsibilities of professional societies and the need for a greater understanding of and involvement in international issues related to information processing will also be covered by Ralston.

Four Plenary Sessions

There will be four special plenary sessions at NCC, and they are open to all conference attendees. In addition to the Ralston session, there will be an international plenary session on Monday chaired by Bob O. Evans, president of IBM's Systems Communications Division.

"The Computer Profession" will be the focus of a plenary session on Tuesday. It will be chaired by Dr. Ruth M. Davis, director of the Institute for Computer Sciences and Technology at the National Bureau of standards.

A plenary session on "Public Policy and Computers" will be held Wednesday and chaired by Janice C. Lipsen, president of Counselors for Management, Inc.

Some of the special activities included in the NCC program will be the National Student Computer Fair, the Computer Graphics Art Exhibit, a technical demonstration of networking and interactive computer communications utilizing the facilities of Telenet's national network, the annual NCC Computer Science Film Theater and a multimedia presentation by the Mimi Garrard Dance Theater.

NCC Preview

A preconference briefing will be held for NCC registrants on Sunday, June 6 and will be repeated Monday, June 7.

The briefing, "How to Benefit From Attendance at an NCC," will provide an overview of the conference sessions, guidelines on attending the exhibit and a description of professional development seminars, special activities and and Bicentennial events coinciding with this year's NCC.

The conference sessions have been divided into three major areas – "Computers and People," "Systems" and "Science and Technology". Each area consists of approximately 40 sessions within four topic tracks.

"Computers and People" will explore such topics as data security, public policy issues, computers and the physically handicapped, public access to computers, industry and university relationships, software productivity, criminal justice systems and medicine and health care.

The four tracts within this area will be "Societal Concerns," "Computer Profession," "Issues in Computing" and "Applications Serving People."

"Systems" will explore the aspects of contemporary systems, including their design, measurement, management and application.

Some of the topics to be covered include system design, system management and planning, word processing and office automation, microprocessors, minicomputers, computer system performance and evaluation, minicomputers, computer-assisted manufacturing and computer-controlled publication.

'Science and Technology'

"Science and Technology" will focus on developments in computer science and their applications as well as data base architecture and software.

"Emphais will be on the implications of those ideas which will impact further future computer usage, management and operation of computer systems," Afips said.

"Computer and Data Base Architecture," "Software," "Computer Science" and "Applications of Computer Science" will be the four tracts within this area.

Attention will be focused on computer architecture, software design and engineering, artificial intelligence, data base architecture, developing data base systems, programming languages, mathematical programming, computer graphics and computer studies in the humanities.

Conference Continuing to Grow As 304 Vendors Sign Up to Show

NEW YORK – The National Computer Conference (NCC) has developed the habit of growing larger every year – and 1976 will be no exception, according to the American Federation of Information Processing Societies, Inc. (Afips), the conference sponsor.

This year there will be 304 exhibitors using 943 booths at the New York Coliseum here on June 7-10. Afips expects between 35,000 and 40,000 attendees to view those exhibits.

In 1975, 34,226 attendees visited NCC in Anaheim, Calif. At that show, 278 companies rented 799 booths on the exhibit floor.

The NCC exhibitors will be in the following categories: mainframes, minicomputers, data communications equipment, data conversion systems, displays, tape systems, memory systems, plotters, printers, software services, source data collection equipment, terminals, test equipment, time-sharing services, components, supplies and accessories.

Further information on the conference is available from Afips at 210 Summit Ave., Montvale, N.J. 07645.

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MRI Planning to Demonstrate System 2000 Version 2.7 DBMS

NEW YORK – MRI Systems Corp. will exhibit Version 2.7 of its System 2000 data base management system (DBMS) at Booth 1115.

Using the updated release in general processing batch and on-line environments have shown throughput improvements by factors of 2:1 and 4:1, MRI said.

Version 2.7 features include multiple virtual storage compatibility and a buffer manager, the company said.

Other enhancements include an extended Where Clause which allows key- and nonkey elements in the clause for Immediate Access; Report Writer and the Extended PL/1 precompilers; improvements to self-contained language processing in multithread teleprocessing environments; additional statistical aids for data base administrators; and an extended procedural language interface Cobol precompiler and PL/1 precompiler.

MRI's version of IBM's Release 2.70 is priced from $30,000 to $110,000 depending on modules selected, MRI said from P.O. Box 9968, 12575 Research Blvd., Austin, Texas 78766.

Software at NCC

Booth 2104 Showing Audit Analyzer

NEW YORK – Analysis – through software packages – will be the order of the day at Program Products, Inc.'s Booth 2104.

The Audit Analyzer incorporates an Audit Function Library which is said to provide easy access to over 30 auditing procedures and produce complete audit reports.

A complete information retrieval analysis and presentation system for business and DP applications, the Data Analyzer offers a multilevel language facility.

The Audit Analyzer costs $15,000 for DOS and an additional $1,000 for OS applications; the Data Analyzer costs $16,000 and $18,000.

There are options available with both products, Program Products said from 95 Chestnut Ridge Road, Montvale, N.J. 07645.

ICS Featuring Gino-F Family

NEW YORK – Innovative Computer Systems, Inc. (ICS) will be featuring the Gino-F family of graphics programs at its booth.

The Gino-F is a library of Fortran subroutines used to create graphics and is machine- and device-independent, according to the firm.

The graphics system is installed on minis as well as larger machines and may be used interactively or in batch mode, the firm said.

ICS, which is at 525 Providence Highway, Norwood, Mass. 02062, is agent for the creator of Gino-F, the Computer Aided Design Centre of the UK.

Cullinane Spotting EEO Program Package

NEW YORK – Cullinane Corp. will show several of its software packages at Booth 1411.

One of the newer products featured will be its EEO-Affirmative Action Reporter, designed to assist Equal Employment Opportunity (EEO) officers and personnel department managers in preparing reports and implementing affirmative action programs, the company said.

The package generates reports to analyze workforce composition, employee participation in job decisions, minority employment, demographic data and applicant flow, Cullinane said.

Other packages that will be exhibited include Culprit, an output processor that provides file retrieval and report generation; EDP Auditor, an audit retrieval system; and the Integrated Data Base Management System (IDMS), which is an implementation of the most recent Codasyl Data Base Task Group language specifications, the company said.

EEO–Affirmative Action and Culprit are priced at $20,000, EDP-Auditor at $15,000 and IDMS at $40,000 from the firm at Wellesley Office Park, 20 William St., Wellesley, Mass. 02181.

Filegard to Launch 'Unwrite Ring' Unit

NEW YORK – A hardware method to prevent undesired erasure or alteration of data from magnetic tapes will be introduced by Filegard Systems at Booth 1032.

Called Filegard, the product is the opposite of the file protect/write ring inserted in the magnetic tape reel grove to activate the "write enable" switch.

It is, instead, an "unwrite ring" which physically blocks insertion of the file protect/write ring without activating the "write enable" switch.

The product, which effectively converts the magnetic tape to read-only storage, requires a tool for removal which can also be used to install it.

Available in quantities of 1,000, Filegard costs $195 each and can be obtained from the firm at P.O. Box 3114, Tequesta, Fla. 33458.

Spacesaver Has Filing Units

NEW YORK – Maintaining computer records requires storage space, and Spacesaver Corp. said it will show attendees ways to maximize that space at Booth 2001.

The company will introduce its most recent line of manual and electric mobile filing and storage carriage systems ranging from 3-ft mini units to 68-ft carriages.

Spacesaver is at 1450 Janesville Ave., Fort Atkinson, Wis. 53538.

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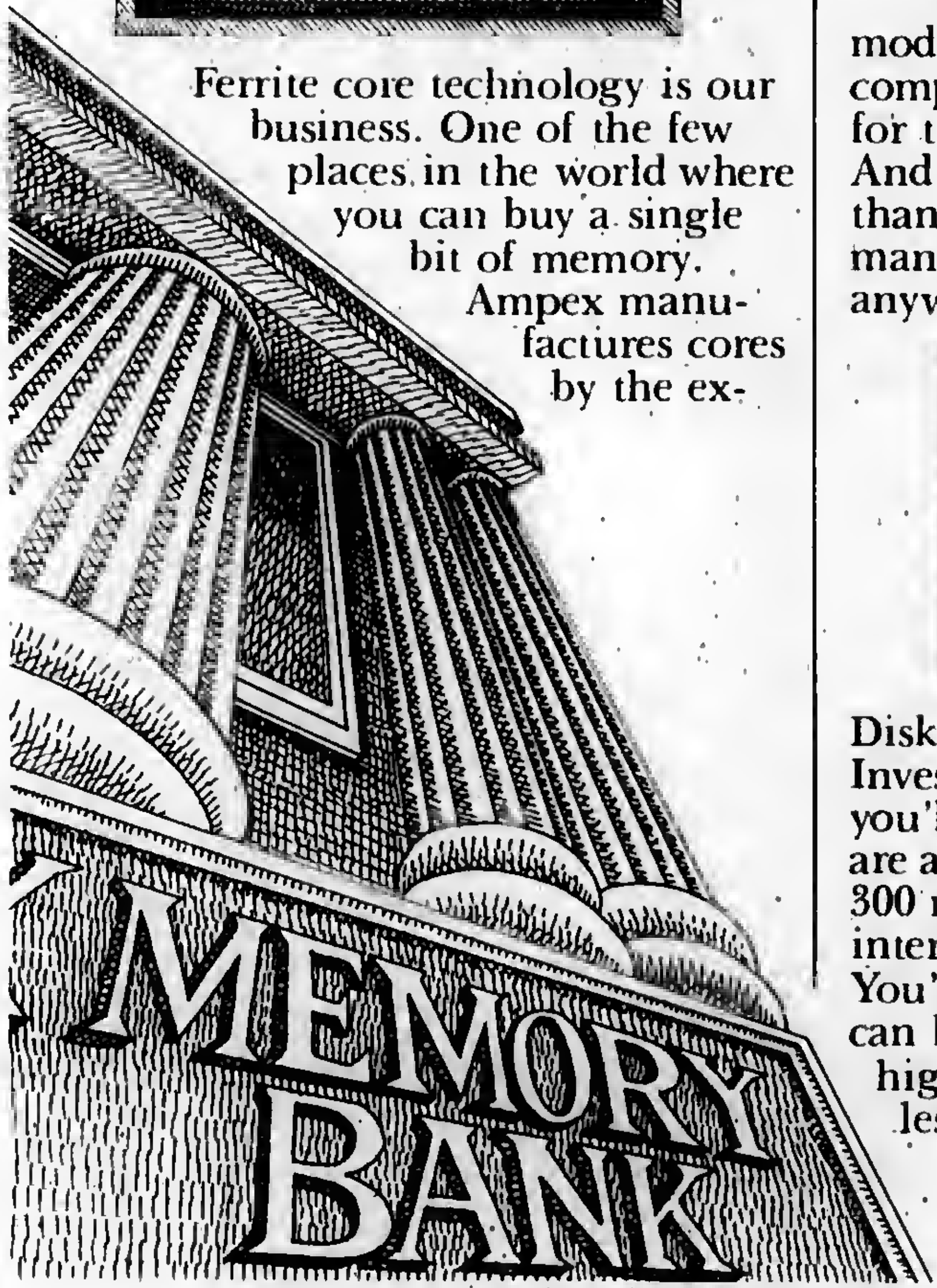
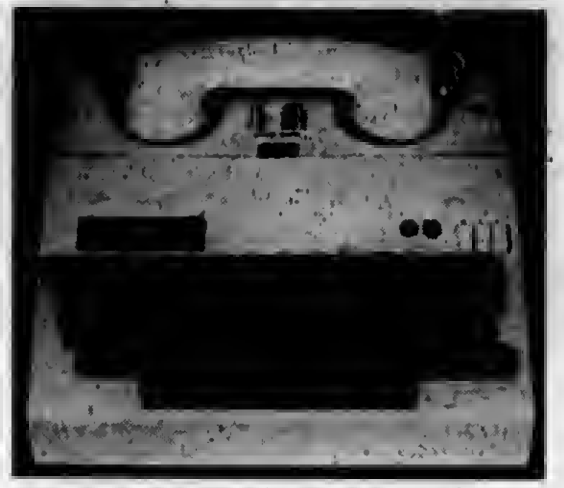


Communications at NCC

Interactive CRT Also Bowing

Digi-Log DLM II Line Fault Isolator Slated to Debut

NEW YORK – Digi-Log Systems, Inc. will introduce its Model DLM II communication line fault-isolation device and the Telecomputer II interactive CRT terminal at Booths 2014 and 2016.



Telecomputer II Briefcase CRT

The DLM II diagnostic test unit offers standard features including a CRT display of the upper- and lower-case Ascii character set, a half-intensity display to separate transmitted from received data and a 1,280-character display field, the company said.

All the features of the DLM I have been retained in this model, Digi-Log said, including monitoring and LED display of line-error and RS-232 line status signals and 15 selectable data rates up to 9,600 bit/sec.

The DLM II is priced at $2,495.

The Telecomputer II briefcase CRT terminal, which replaces the company's models 209 and 33, incorporates switch-selectable line lengths on a 1,280-character display and transmission rates from 50- to 9,600 bit/sec, the firm said.

The interactive terminal costs $1,295; with acoustic coupler, 5-in. CRT and case, it is priced at $1,795.

ICC/Milgo to Show Working Tech Control Center

NEW YORK – An exhibit of the ICC/Milgo Communications Center, demonstrating centralized data network monitoring and control will be featured at Booth 2201.

The center offers the systems operator the capability to monitor and control a data communications network from a central facility, the company said.

Users can tailor a Communications Center to their requirements by combining modules such as EIA and VF patch panels, data line monitors, status displays and communications test equipment, according to a spokesman.

Each center is configured to the individual customer and price is dependent on the user's requirements. ICC/Milgo is at 8600 N.W. 41st St., Miami, Fla. 33166.

ARC to Demonstrate Intershake Monitor

NEW YORK – Atlantic Research Corp. (ARC) will demonstrate the Intershake II programmable data communications monitor and interactive tester at Booths 1542 and 1543.

ARC Intershake II

The tester is said to handle all transmission codes and line disciplines at speeds up to 256 kbit/sec with an external clock and provides for half- and full-duplex testing, the firm said.

Atlantic Research is located at 5390 Cherokee Ave., Alexandria, Va., 22314.

NAC Bringing Tools To Help Design Nets

NEW YORK – Network Analysis Corp. (NAC) will hold demonstrations of computer-aided design tools related to computer and communications network architecture at Booth 1102.

The company is also featuring related services including feasibility studies, requirements analysis, technical strategy evaluation and analysis and design, among others, it said from Beechwood, Old Tappan Road, Glen Cove, N.Y. 11542.

Vadic Plans Introduction Of Macs at Booth 2846

NEW YORK – Macs will debut at the Vadic Corp. exhibit at Booth 2846.

Macs stands for Multiline Automatic Calling System. It will be shown along with Vadic's VA831, an RS-232/RS-366 adapter, and the VA3400, a full-duplex 1,200 bit/sec modem for use on two-wire leased lines.

Macs reportedly enables a single computer port to initiate dialing on up to 60 lines; each dialer controls up to 15 modems, Vadic said from 505 E. Middlefield Road, Mountain View, Calif. 94043.

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Withdraw spare parts from your inventory, and you'll find another strong reason to use Ampex disk drives. The high degree of parts commonality among various models means you'll deposit far less inventory in your stores department, and save both time and money when it comes to maintenance.

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Ampex Mass Storage Systems
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Sunnyvale, California 94086
(408) 738-4910

AMPEX REMEMBERS

3M Plans Displays

NEW YORK – The 3M Co. will display its Laser Beam Recorder, Beta System 700H with optional disk file and Model 114 computer output microfilm (COM) fiche reader at Booths 3001 and 3003.

The Laser Beam Recorder records data from a computer to microfilm and microfiche. It writes alphanumeric images directly on 3M Dry Silver Film and produces 16mm or 106mm film.

The Beta System 700H is a minicomputer-controlled COM unit whose output formats include indexing and titling of fiche from standard print tapes. The system can produce both alphanumeric output and graphic images on film, the firm said.

The Model 114 fiche reader offers a three-quarter size COM image on a bright screen, 3M said from its Microfilm Products Division, 3M Center, St. Paul, Minn. 55101.

BTI to Launch Interactive T/S Systems

NEW YORK – Basic Timesharing, Inc. (BTI) will introduce three incentive timesharing systems at Booth 1529.

The models 4000/15, 4000/25 and 4000/35 will replace BTI's 4000/10, 4000/20 and 4000/30 systems. Improvements have been made in central processor performance, on-line storage, software mobility and system packaging, BTI claimed.

All models feature software backup and entry via a magnetic tape unit utilizing a tape pack, BTI said.

Bidirectional communications between each BTI system and another computer is also possible now with the addition of optional dual polling ports, which are compatible with Bell 202C-type modems and have dial-out capability, the company said.

Each model in the 4000 series incorporates the same central porcessor with 64K bytes of semiconductor memory.

The Model 4000/15 provides 7.5M bytes of nonremovable disk storage; it sells for $35,950.

The Model 4000/25 includes 49M bytes of on-line storage; it is priced at $56,300.

The Model 4000/35 has 73M bytes of on-line storage; it costs $64,300.

BTI is at 650 N. Mary Ave., Sunnyvale, Calif. 94086.

Cade to Highlight Univac Exhibit

NEW YORK – Univac will demonstrate its 1900 Computer-Assisted Data Entry (Cade) system as well as the Uniscope 100 and 200 visual display terminals at Booth 3210.

Cade is a shared-processor, key-to-disk system. The basic configuration includes one to eight keyboards with visual displays; a CPU with 48K bytes of main memory and a disk subsystem; and 7- or 9-channel tape transport, Univac said.

One of the Uniscope 200 units will be linked to a Univac 9400 computer system at the Sunnen Products Co. in St. Louis to demonstrate the Univac Industrial System (Unis) manufacturing control program.

Systems at NCC

Other terminals will be used to demonstrate educational language and government information systems, Univac said from P.O. Box 500, Blue Bell, Pa. 19422.

Uniscope 100 Terminal

Hendrix Showcasing Page Reader for OCR

NEW YORK – A demonstration of the recently introduced OCR-2 will be given by Hendrix Electronics, Inc. at Booth 2042.

Hendrix described the optical character recognition (OCR) device as "an inexpensive, high-performance optical page reader for OCR-A or OCR-B fonts." The unit reads up to 220 char./sec, the firm said.

The OCR-2 offers automatic elimination of multiple spaces and end-of-line hyphens; TTS coding is available for paper tape output, Hendrix said.

A "forms limit switch" permits the OCR-2 user to identify any portion of the page depth of a "forms" area which should not be scanned, the company added.

To demonstrate the product, it will be used as an input device for a Hendrix editing terminal, the Model 5200, which will display the typed copy being fed into the OCR-2 on a video display screen, Hendrix said.

The OCR-2 is priced at $11,500 for single units, Hendrix said from 645 Harvey Rd., Manchester, N.H. 03103.

Documation Gearing Exhibit To Impact Line Printer

NEW YORK – The Documation, Inc. DOC 2250 impact line printer will be shown at Booth 3230.

The printer is capable of printing at a speed of 2,250 line/min, single-spaced, using a graphic 48-character set, Documation said.

A freestanding unit containing its own power supply and control logic in an integrated controller, the DOC 2250 communicates through its interface with a host CPU.

Documation can be reached through Box 1240, Melbourne, Fla. 32901.

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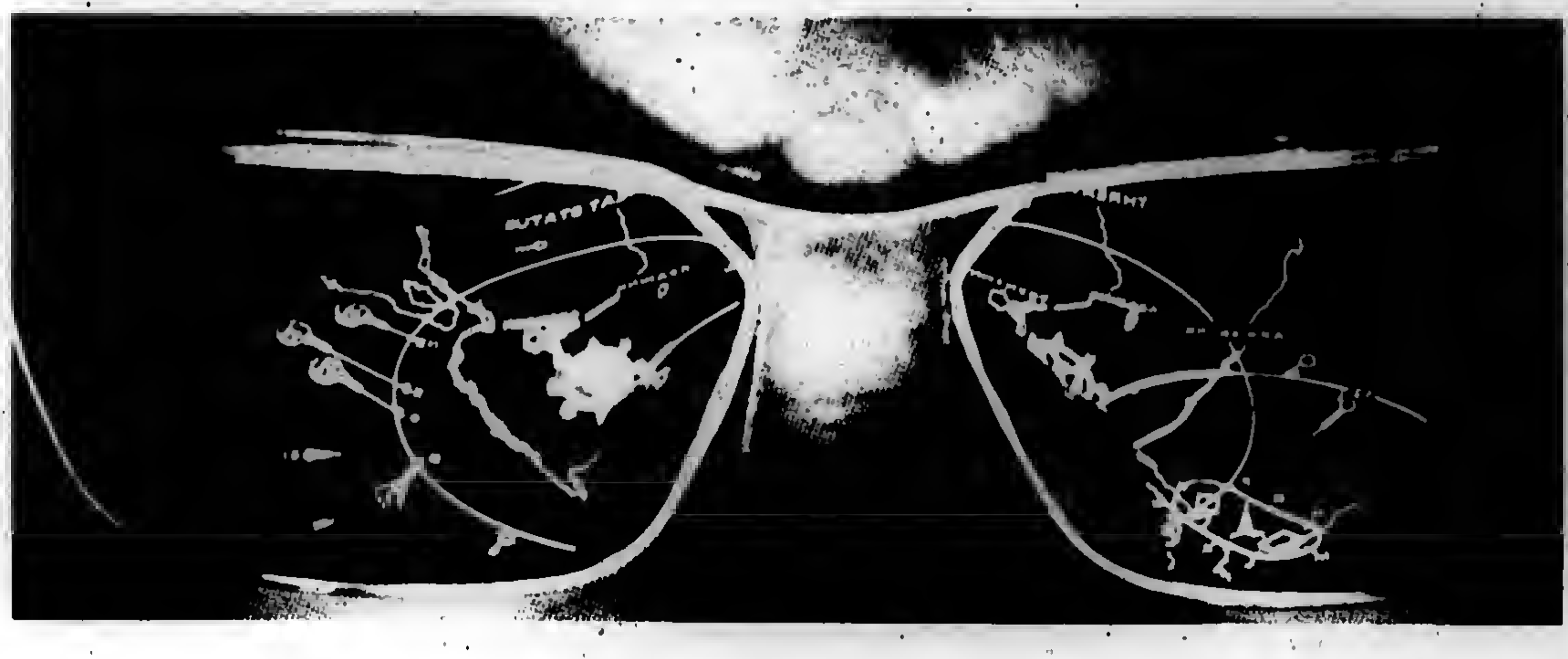

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Systems at NCC

MRS-90 Graphic Display System Scheduled for Exhibit by Ragen

NEW YORK – A graphic information system said to eliminate the need for paper files and 75% of hard-copy printout can be seen at Booths 1015 and 1017, according to its vendor, Ragen Information Systems.

The Ragen MRS-90 graphic information system retrieves, displays and offers hard copy of any page or series of pages out of more than one million letter-size pages of graphic information in an average of 10 secs, Ragen said.

Information stored on computer output microfilm (COM) is particularly accessible with this device, the company noted.

Modular in construction, the system consists of a terminal, a memory unit end a data capture center.

In addition to accessing 16mm roll-film COM, the system is capable of multiplexing up to 15 terminals by hard-wire or voice-grade telephone lines; provides hard, dry copy on demand; secures confidential information; and can be interfaced to such peripherals as line printers, punched card readers, magnetic tape transports, CRTs and tape cassettes, the company said.

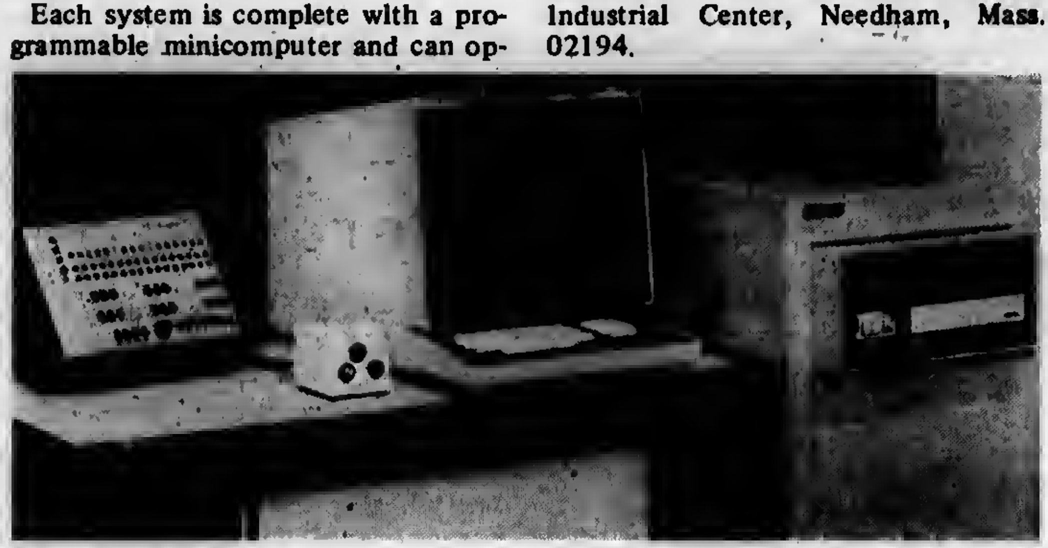
The MRS-90 is available from the firm at 77 Water St., New York, N.Y. 10005 for less than $70,000. Rental and lease plans are also available.

Imlac to Star Three PDS-4s

NEW YORK – Imlac Corp. will exhibit three of its PDS-4 interactive graphic display systems at Booth 1101.

Each system is complete with a programmable minicomputer and can operate as either a remote terminal or freestanding graphics system.

Prices start at $17,300, the company said from 150 A St., New England Industrial Center, Needham, Mass. 02194.



Imlac PDS-4 System

Peripherals at NCC

Printronix Readying Series 300 Printer

NEW YORK – Printronix will exhibit its 300 Series matrix printer at Booth 1816.

The unit has a print speed of 300 line/min or 170 line/min for double-height characters and 240 line/min when underlining or printing lower-case characters with tails below the line, the company said.

Characters are printed in a 7 by 9 dot matrix format at 132 char./line and 10 char./in.; the character set contains 64 standard Ascii characters, it added.

A basic Series 300 printer with a Data Products, Inc. or Centronics Data Computer Corp. interface and electronic vertical forms unit costs $4,500 from Printronix at 17935 Sky Park Circle, Irvine, Calif. 92707.

Program Loader Debut Planned by Qantex

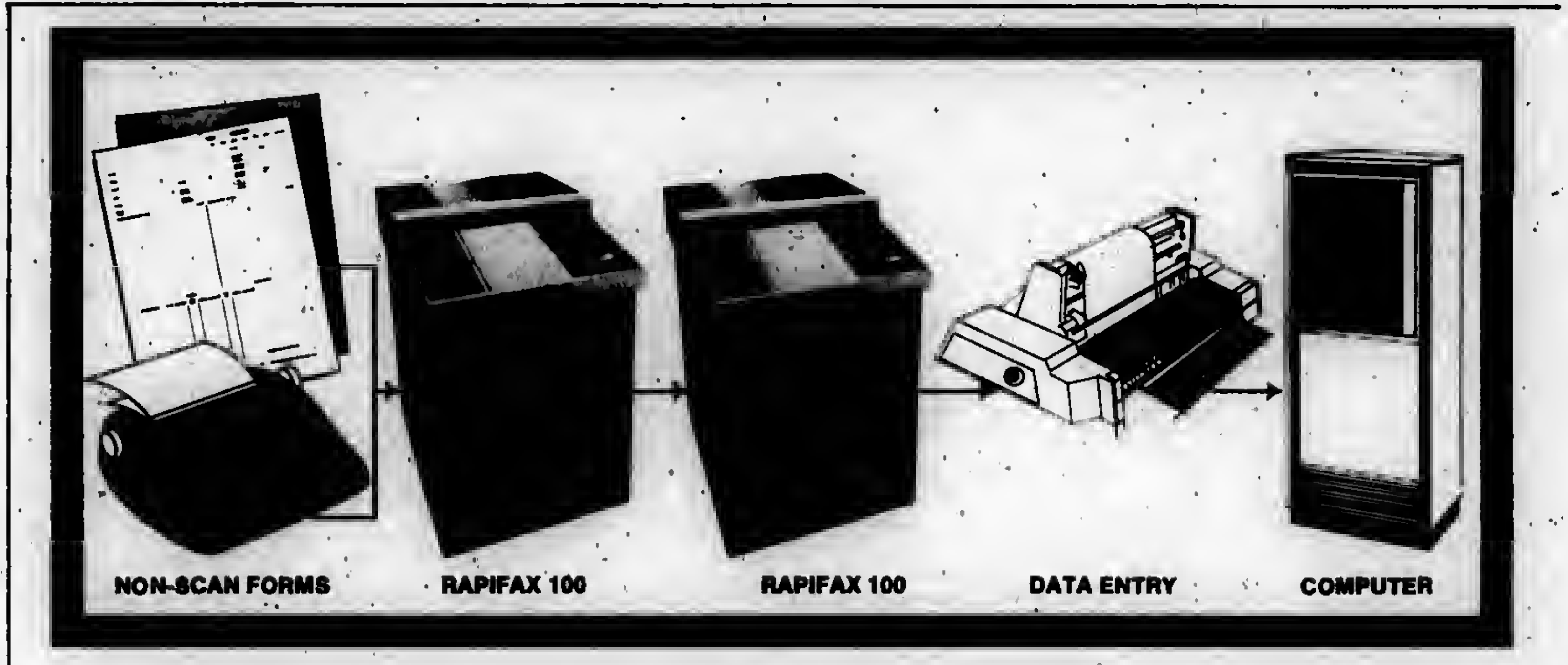
NEW YORK – Qantex Division of North Atlantic Industries, Inc. will unveil its Model 2710 portable program loader/logger and a militarized cartridge magnetic tape unit at NCC Booths 2831 and 2833. Both units utilize the 3M Co. data cartridge.

Interfaces for Most Minis

The 2710 is available with up to two tape drives and interfaces for most minis and micros, according to the firm at 200 Terminal Drive, Plainview, N.Y. 11803.

Price of a 2710 with one tape drive and no interface starts at $2,285 in unit quantity.

The transfer rate of both units is 6,000 byte/sec, end density is 1,600 bit/in.



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Drives Have Inertial Actuator

Diablo Plans to Put Series 400 to Work

NEW YORK – Several disk and printer products will be introduced and demonstrated by Diablo Systems, Inc. at Booth 3320.

A working display of the Diablo Series 400 disk drives will demonstrate some of the features of this family of cartridge drives, which offer a Diablo-developed inertial actuator that permits two head positioners in each drive package, the firm said.

100% Common Sparea

The Series 400 drives, which are offered in capacities up to 40M bytes, have 100% common spares, common dimensions and operational features such as power interrupt protection and data track servo following, Diablo said.

Diablo's matrix printer will also be demonstrated. It can print at speeds up to 200 char./sec and has a Diablo-designed 9-wire matrix head that prints both upper- and lower-case characters, the firm said.

Peripherals at NCC

Other features include microprocessor control, internal power supply, ribbon cartridges and a line of accessories, the firm added.

Diablo will also demonstrate its Hyterm data communications terminal's graphics capability, print quality, high-speed tabbing and other features, it claimed. The unit is RS-232C compatible and communicates in Ascii code, Diablo said.

Both receive-only and send/receive models will be on display.

Two Serial Printers

In addition, the Diablo booth will feature two Hytype II serial printers – a 45- and a 55 char./sec model. The printers offer bottom feed, split platen, end-of-ribbon and paper-out signals, optical character recognition wheels and an 8-bit parallel microprocessor interface, the company said.

The Model 1355WP Hytype mechanism will be shown as a printer specifically suited for word-processing applications, the company said.

Model 1355 Word-Processing Mechanism

Also on display will be the Series 30 disk drive, the Model 44B in the Diablo Series 40 line and revamped Series 10 dual flexible diskette drives.

Diablo is at 24500 Industrial Blvd., Hayward, Calif. 94545.

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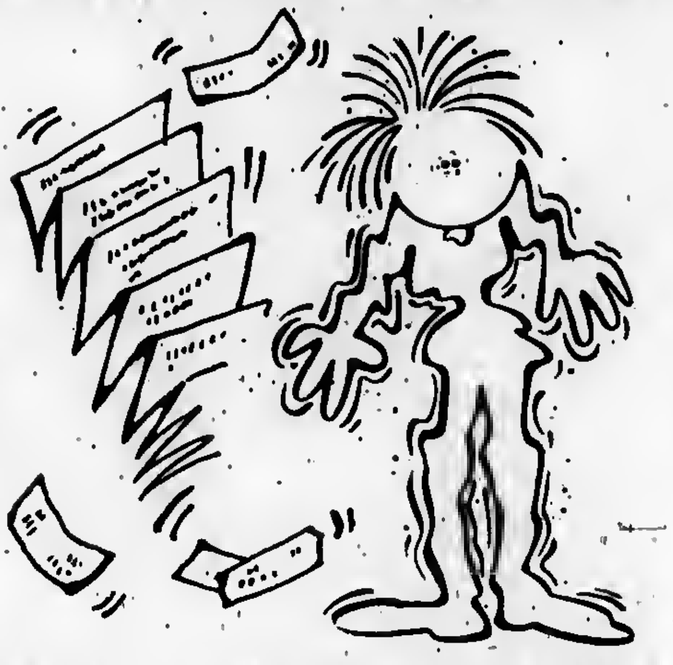

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Termicette Recorder To Star at Booth 1511

NEW YORK – International Computer Products, Inc. will display its line of low-priced Termicette communications recorders and a fixed-disk multiprocessor at Booth 1511.

The Termicette 2020, which uses digital cassettes for recording and playback at rates up to 1,200 bit/sec was designed for program loading and microprocessors and minicomputers.

It sells for $690.

The ICP-700 multiprocessor is capable of memory partitioning in segments up to 32K bytes. Priorities are established as a function of the jobstream and may be reestablished by the operator, the vendor said.

Termicette 2020

The smallest version is equipped with a 32K CPU, CRT, dot matrix printer and 9.6M-byte disk and is priced at $29,500.

Both are available from the firm at 2925 Merrell Road, Dallas, Texas 75229.

Wangco Exhibit to Include Magnetic Tape Systems

NEW YORK – Wangco, Inc. will be showing its magnetic tape systems for minicomputers and its tape and moving-head disk systems for Digital Equipment Corp. PDP-11 minicomputers at Booth 1521.

The company will also demonstrate related peripherals, such as formatters and controllers, Wangco said.

Wangco is located at 5404 Jandy Place, Los Angeles, Calif. 90066.

Topaz to Show Transformers

NEW YORK – A line of 50 kVA through 130 kVA transformers for ac line noise attenuation will be exhibited in Booths 1036 and 1038 by Topaz Electronics.

The firm will also introduce a line of uninterruptible power systems that are rated from 3 kVA through 15 kVA single phase and will exhibit its line of ac power line regulators.

Topaz is at 3855 Ruffin Road, San Diego, Calif. 92123.

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Cost for the entire seminar, including continental breakfasts, luncheons, dinner, and all course materials is $325 per registrant, and $300 for each additional registrant from the same company. An additional $50 bonus discount will apply to each registration received by June 7, 1976.

Chicago	**Drake Hotel**	**June 17-18**

Data Communications Course #1010 —Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

New York	**Plaza Hotel**	**June 14-15**
San Diego	**Plaza International**	**Sept. 27-28**
Denver	**Brown Palace**	**Oct. 18-19**
Miami	**Holiday Inn Airport Lakes**	**Nov. 15-16**

Data Communications Course #1020 —Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations.

Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

New York	**Summit Hotel**	**Sept. 13-15**
Miami	**Holiday Inn Airport Lakes**	**Nov. 29-Dec. 1**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Chicago	**Hyatt Regency O'Hare**	**June 16-18**
New York	**Summit Hotel**	**June 23-25**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams.

Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Write for summer schedule

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

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Note: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

Peripherals at NCC

Cassette Tape Transport System For Micros at Braemar Booth

NEW YORK – A cassette tape transport system, designed particularly for microprocessor use and featuring TTL compatibility, will be displayed by Braemar Computer Devices, Inc. at Booth 2745.

Based on the vendor's CD-200 transport, the device accepts and delivers serial digital data at TTL levels at 8 kbit/sec.

Called the CS-400 digital cassette tape transport system, the unit operates at a nominal density of 800 bit/in. at 10 in./sec.

The system has two-channel capability and both tape tracks are available for data. The active channel is determined via TTL command; this feature allows the user to write one track, switch channels, change direction and continue writing on the other track, omitting the need to rewind, Braemar said.

The CS-400 utilizes the Manchester phase-encoding technique and provides Ansi-compatible data, Braemar said.

It also employs "Auto Sync," a decoding scheme with internal compensation for any bit-to-bit variations encountered.

Available in six weeks from the OEM manufacturer at 11950 Twelfth Ave. South, Burnsville, Minn. 55337, the unit costs $600 for evaluation units and $460 each in quantities of 10 and $350 in quantities of 1,000.

Dataproducts Sets Debuts

NEW YORK – Dataproducts Corp. will have both printer equipment and core memory systems at Booth 1329.

The Model 2290 line printer and the Mark IV printer hammer bank will be exhibited for the first time, as will the Store/3220 core memory system and a special 32K memory bank, the firm said.

The 2290 is a 900 line/min unit with a 136-character line width. The OEM price is "under $12,500" with quantity discounts available.

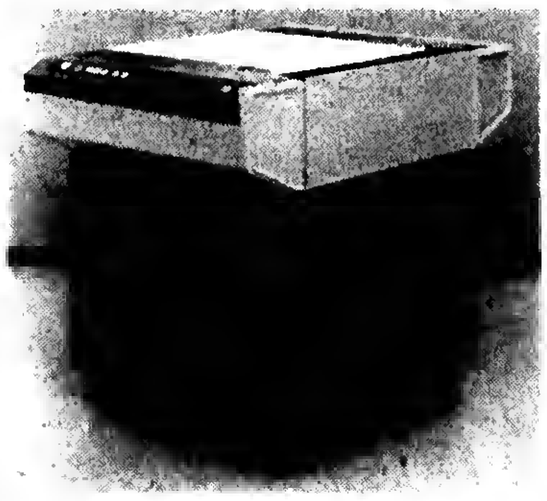
The display at Dataproducts' booth will also include four other printers, four memory systems previously exhibited, printer components and printer ribbons, a spokesman added from 6219 DeSoto Ave., Woodland Hills, Calif. 91364.

Versatec Plotter Going Public

NEW YORK – The first public demonstration of Versatec, Inc.'s 24-in. wide electrostatic plotter will be given at Booths 2718, 2720 and 2722.

A 72-in. electrostatic plotter, a plotter which produces hard copy from a Tektronix terminal and an OEM line of electrostatic plotters will also be demonstrated, the company said.

All together, Versatec will display eight electrostatic plotters offering a choice of 22- or 24-in. paper width, vertical plotting speed of 1- or 2 in./sec and resolution of 100- or 200 dot/in.


Versatec 24-In. Plotter

Four models offer character generation and a simultaneous print/plot option for display of captions, legends and other alphanumeric data while plotting, Versatec said.

A Versatec system controller links any of the plotters with IBM 360/370 computers; it is compatible with standard IBM software and system protocols, Versatec said.

Prices range from $13,500 for the 22-in. plotter with 100 dot/in. resolution to $22,400 for the 24-in. plotter with 200 dot/in. resolution and character generator.

The firm is at 2805 Bowers Ave., Santa Clara, Calif. 95051.

Facit-Addo to Show 3740-Like Floppy

NEW YORK – A flexible disk drive which is IBM 3740-compatible, the Facit 4231 will be featured by Facit-Addo, Inc. with other of its products at Booths 1615, 1617 and 1619.

The drive is available in both a single and dual version. Track-to-track access time is 4 msec maximum, the firm said.

In the dual model, the loading rotation and access mechanisms and the drive electronics are common, the vendor noted.

The Facit 4231 has a loading mechanism which provides "exact disk positioning" by utilizing a driving spindle and a moving, self-adjusting lightweight cone, Facit-Addo said.

The company is located at 66 Field Point Road, Greenwich, Conn. 06830.

Magnetic Stripe Encoders Focus of Mag-Tek Exhibit

NEW YORK – Booth 3313 will be the scene of the introduction of a series of magnetic stripe encoders by Mag-Tek Corp.

The MT-75 encoders operate under the control of an 8-bit microprocessor and are programmed to encode cards to industry standards, according to the company.

The read/write card transport used in the MT-75 is available as a subsystem and has an RS-232 interface, Mag-Tek said from 1513 E. Del Amo Blvd., Carson, Calif. 90746.

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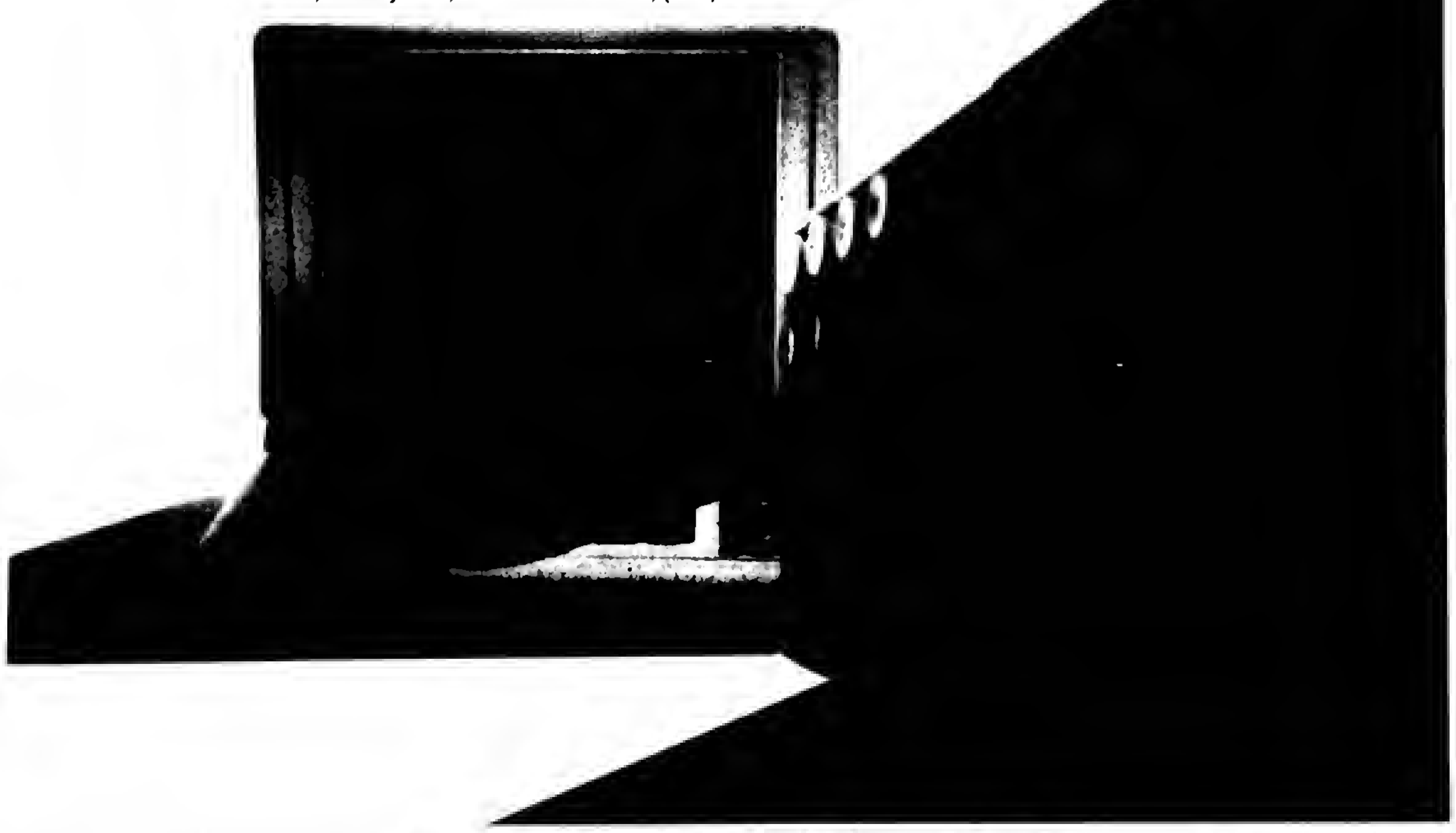


For OEM & Distributor pricing information contact OMRON, Sunnyvale, CA. Offices: OMRON CORPORATION OF AMERICA · Oxon Hill, Md. (301) 248-2150; Englewood Cliffs, N.J., (201) 871-3460 OMRON Europe GmbH, Hamburger Strasse 11, West Germany. TWX 841/213-403 + , OMRON Tateisi Electronics Co., Tokyo AP 149.

Peripherals at NCC

T-300 Stores 300M Bytes

Calcomp Set to Launch Latest Trident

NEW YORK – California Computer Products, Inc. (Calcomp) will introduce the T-300, the latest member in its Trident family of disk drives, and demonstrate for the first time its table-top plotter, the Calcomp 836, at Booth 2243.

An enhanced version of its Microfiche Management System, the Calcomp 960 vertical plotter and three other members of the Trident line will also be shown.

The T-300 features a 300M-byte capacity and takes an IBM 3336-II type disk pack with a density of 6,060 bit/in., Calcomp said.

The transfer rate is 1,209 byte/sec and the track-to-track access time is 10 msec, the firm added. The unit sells for $11,750.

The 836 plotter has an RS-232C interface and can be driven on-line or off-line by a Calcomp 900 series controller, while the 960 plotter operates off-line with a Calcomp 925 controller as well as on-line to any device with an RS-232 interface.

The Microfiche Management System is a computer output microfilm (COM) unit that can be leased for about $3,000/mo. Enhancements to be demonstrated include software for fiche indexing and titling and improvements that are said to provide more efficient use of the 32K of core in the system's off-line controller.

Other members of the Trident line on display will include units with 25M-, 50M- and 80M-byte capacities.

Other Trident Models

The firm will also show both of its floppy disk drives, the 140 with a capacity of 400K bytes per diskette and the 142 with up to 802K bytes per diskette.

Calcomp is at 2411 W. LaPalma, Anaheim, Calif. 92801.

Dispersed Processing Sycor Exhibit Theme

NEW YORK – Sycor, Inc.'s line of distributed data processing systems – from the Model 350 intelligent stand-alone terminal to the Sycor 440 clustered terminal processing system and the 250 intelligent display system – will be shown in Booth 2731.

The Model 350 incorporates two flexible disks into a desk-top, intelligent terminal. With 16K bytes of programmable memory, the Model 350 uses TAL II, version of the company's Terminal Application Language for local inquiry/response and data entry.

Software- and communications-compatible with the Model 350, the Sycor 440 combines a 10M-character disk with up to eight video display stations.

On-Line Products

For distributed on-line applications, Sycor will be exhibiting its IBM 3270-compatible series of display stations, stand-alone terminals and printers. Equipped with its own user-programmable language and a dual flexible disk option, the Sycor 250 allows users to store formats or programs locally on diskette.

All three product lines will exhibit Sycor's microprocessor-controlled printers operating at 60-, 120- and 180 char./sec printers feature bidirectional printing.

Sycor is at 100 Phoenix Drive, Ann Arbor, Mich. 48103.

Techtran at Three Booths With Cassette Recorders

NEW YORK – Techtran Industries, Inc.'s display at Booths 2825, 2827 and 2829 will feature its family of single- and dual-cassette recorders.

All units are compatible with an RS-232 interface and can be plugged into keyboard printers, CRTs, minicomputers and data loggers, the firm said.

In addition, the firm will introduce the Model 9512 micro disk, a flexible disk recording/editing terminal, the company said.

The desktop unit connects to data terminals, CRTs and minicomputers, it added.

Features include IBM format, removable disks with 256K characters per disk, selectable speeds from 110- to 9,600 bit/sec, track/sector addressing, bidirectional skip, print ID selector, dual RS-232C interfaces and track/sector indicators.

The unit costs $2,500, Techtran said from 580 Jefferson Road, Rochester, N.Y. 14623.

Elgar Repackages UPS Line

NEW YORK – At Booth 2224, Elgar Corp. will exhibit at least two models of its repackaged and expanded line of uninterruptible power supply (UPS) systems.

The systems' prices range from $2,075 to $34,400, Elgar said from 8225 Mercury Court, San Diego, Calif. 92111.

GSI to Show Floppy

NEW YORK – Booths 3410 and 3412 will be the scene of a demonstration of a flexible disk drive capable of single- or double-density operation, according to its developer, General Systems International, Inc. (GSI).

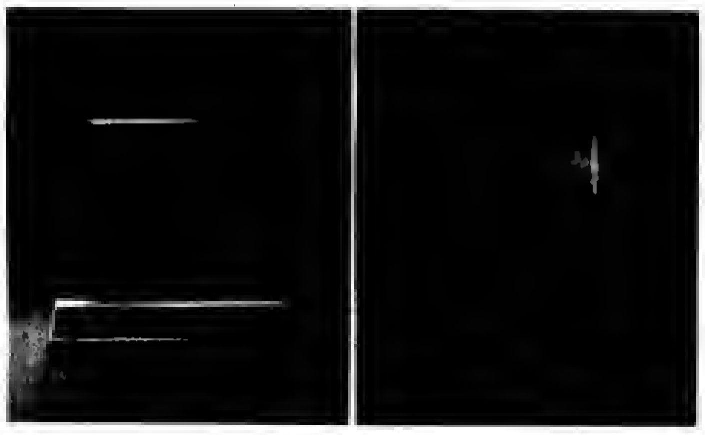
For double-density applications, the GSI-110 accommodates up to 6.4M bits of data on one side. Single-density storage in variable formats provides up to 3.2M bits of data, the firm said.

The drive is IBM-compatible and will read or write IBM 3740-formatted diskettes for up to 1.9M data bits, GSI noted.

The unit also features a one- to 4-drive daisy chain capability, parallel ready lines, and separation of clock, data and track sensing.

The GSI-110 is priced at $500 in quantities of 100, the vendor said from 1440 Allec St., Anaheim, Calif. 92805.

Hours and Theirs



Plug our brand new Plus 70 printer and display station into your IBM 3271 or 3272 controller. A couple of hours is all we need to convince you we can outperform your 3277 or 3286 or whatever else you have tied to your 360 or 370. Designed and manufactured by Trivex, the microprocessor controlled display station and printer are both IBM compatible at the box level. And, for systems level compatibility, we can supply Trivex controllers, too. The only area in which we're *not* IBM compatible in fact, is price. The Plus 70 sells or leases for considerably less than IBM's. And it delivers in only 60 days, ready to expand whenever you expand. Delivers faster, costs less, and it's compatible. How can you go wrong? You can't. We're so sure, in fact, we're willing to make this proposition: if, after a week or so of comparison, you're still not convinced – and you stick with theirs – we'll give you a five function digital pocketwatch just for trying ours. Buy or lease ours, and chances are good we'll throw in the pocket watch anyway. Either way, give us a call as soon as possible. After all, time is money. Trivex Incorporated, 3180 Redhill Ave. Costa Mesa, California 92626 (714) 546-7781
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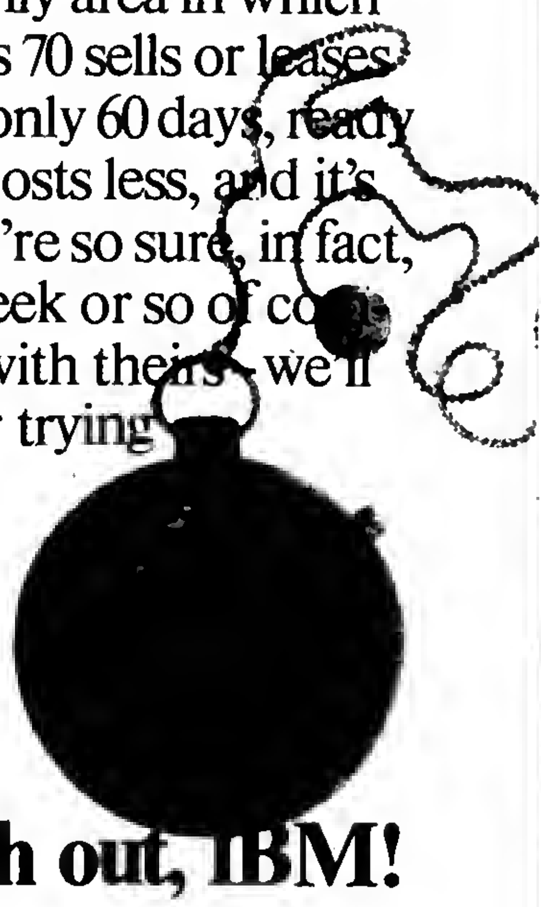
(201) 461-4712



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		7	8	9	10	11	12	13	14
		WEDNESDAY MORNING		WEDNESDAY AFTERNOON		THURSDAY MORNING		THURSDAY AFTERNOON	
		8:30 am - 10:00 am	10:15 am - 11:45 am	2:30 pm - 4:00 pm	4:15 pm - 5:45 pm	8:30 am - 10:00 am	10:15 am - 11:45 am	2:30 pm - 4:00 pm	4:15 pm - 5:45 pm
COMPUTERS AND PEOPLE	A **SOCIETAL CONCERNS** Sutton, NYH	● PUBLIC POLICY ISSUES I ●				● PUBLIC POLICY ISSUES II ●			
		Frank D. De George A7 WELFARE PAYMENTS AND THE COMPUTER	*Marilyn E. Courtot* A8 DATA BANKS IN THE FEDERAL ESTABLISHMENT	*Anthony J. Patinella* A9 EFTS: THE POLICY QUESTIONS	*William R. Weber* A10 EFTS: IMPLEMENTATION PROBLEMS	*Neal Gregory* A11 DATA COMMUNICATION POLICY	*Francis Gregory* A12 PRIVACY: THE POLICY QUESTIONS	*John Salasin* A13-14 PRIVACY: THE PSYCHOLOGICAL & SOCIOLOGICAL IMPLICATIONS	
	B **COMPUTER PROFESSION** Royal B, AM	● COMPUTERS AND THE PHYSICALLY HANDICAPPED ●							
		Robert Gildea B7 COMPUTERIZED BRAILLE TRANSLATION	*Steven L. Jamison* B8 COMPUTERS AND SIGN LANGUAGE	*Harry G. Hedgas* B9 COMMUNICATION AIDS FOR THE NON-ORAL	*Harry G. Hedges* B10 READING MACHINES FOR THE BLIND	B11 *Gopal K. Kapur* EXECUTIVE MANAGEMENT MUST BECOME INVOLVED	B12 *Roy F. Kellar* CONCEPTS IN PROGRAMMING AND ADP INSTRUCTIONAL SYS.	B13 *Louise Etra* COMPUTER ART: NEW BREED OF ARTIST TECHNICIAN	B14 *Patsy Scala* ARTISTS & THEIR USE OF COMPUTERS
	C **ISSUES IN COMPUTING** Imperial B, AM	● INDUSTRY & UNIVERSITY RELATIONSHIPS ●				● SOFTWARE PRODUCTIVITY ●			
		Marshall C. Yovits C7 INDUSTRY NEEDS & VIEWS OF COMPUTER SCIENCE GRADUATES	*Marshall C. Yovits* C8 COMPUTER SCIENCE GRADUATES & INDUSTRY	*Marshall C. Yovits* C9-10 INDUSTRY AND UNIVERSITY — PROBLEMS AND SOLUTIONS		*Lloyd Baldwin* C11 PRODUCTIVITY PAYBACK FROM PACKAGED APPLICATION SOFT.	*Eugene I. Lowenthal* C12 HIGH LEVEL LANGUAGES FOR SOFTWARE DEVELOPMENT	*Larry A. Welka* C13-14 QUALITY AND PERFORMANCE MEASUREMENTS FOR SOFTWARE	
	D **APPLICATIONS SERVING PEOPLE** Grand Ballroom East, NYH	● MEDICINE AND HEALTH CARE I ●				● MEDICINE AND HEALTH CARE II ●			
		Thelma Estrin D7 COMPUTERS AND BIO-CYBERNETICS	*Robert S. Ledley* D8 COMPUTERIZED TOMOGRAPHY	*Richard Shepard* D9-10 BIOMEDICAL DATA BASES		*David J. Mishelevich* D11-12 TOWARD THE INTEGRATED HOSPITAL INFORMATION SYSTEMS		*Bernice J. Proctor* D13-14 PATTERN RECOGNITION IN CLINICAL MEDICINE	
SYSTEMS	E **COMPUTER SYSTEMS** Grand Ballroom West, NYH	● MICROPROCESSORS ●				● MINICOMPUTERS ●			
		Reg E. Kaenal E7-8 UNDERSTANDING AND USING MICROPROCESSORS		*Barry R. Borgerson* E9-10 MICROPROCESSOR SYSTEMS		*S. Ron Oliver* E11-12 MINIS VS. MAXIS		*Carol Brown* E13-14 USING MINIS IN LARGE AND SMALL BUSINESSES	
	F **SYSTEMS MANAGEMENT** Mercury, NYH	● COMPUTER SYSTEM PERFORMANCE & EVALUATION I ●				● COMPUTER SYSTEM PERFORMANCE & EVALUATION II ●			
		Philip J. Kiviat F7-8 COMPUTER PERFORMANCE MANAGEMENT		*Gerald Estrin* F9 MEASURES OF PERFORMANCE	*Stephen T. Swift* F10 PERFORMANCE INFORMATION SYSTEMS	*Jeffrey P. Buzan* F11 ISSUES IN COMPUTER SYSTEMS PERFORMANCE	*Jack Moshman* F12 PROBAB. MODELS FOR PREDICT. SYS. THROUGHPUT	*William E. Perry* F13-14 COMPUTER SYSTEMS AUDITABILITY AND CONTROL	
	G **NETWORKING** Imperial A, AM	*Teresa O. Graen* G7 USE OF NETWORKS IN SCIENCE & EDUCATION	*Waltar A. Sadelow* G8 NETWORK ARCHITECTURE	*Stephen R. Kimbleton* G9-10 NETWORK OPERATING SYSTEMS		*Susan Poh* G11-12 NETWORK MEASUREMENTS		*Thomas Pyke, Jr.* G13-14 NETWORK ACCESS TECHNIOUES	
	H **BUSINESS AND INDUSTRY SYSTEMS** Georgian B, AM	● COMPUTER-ASSISTED MANUFACTURING ●				● COMPUTER-CONTROLLED PUBLICATION ●			
		Thomas L. Boardman H7-8 COMPUTER-AIDED MANUFACTURING AND DESIGN		*W. Barkley Fritz* H9-10 COMPUTERS IN THE SHIPBUILDING INDUSTRY		*Norman W. Scharpf* H11-12 COMPUTERS IN TYPESETTING		*Dennis R. Naary* H13-14 INTEGRATION OF MICROFILM AND COMPUTER	
SCIENCE AND TECHNOLOGY	I **COMPUTER & DATA BASE ARCHITECTURE** Georgian A, AM	● DATA BASE ARCHITECTURE ●				● DEVELOPING DATA BASE SYSTEMS ●			
		Etalla Grinoch I7 DATA BASE STRUCTURE	*Susan Brewer* I8 RELATIONAL DATA BASES	*John L. Berg* I9-10 DATA BASE DECISIONS		*Fredric C. Gey* I11-12 SOCIO-ECONOMIC FACTORS IN DATA BASE MANAGEMENT		*Patricia Barglund* I13 MANAGEMENT INFORMATION SYSTEMS	*Norman F. Hirst* I14 AN INTRODUCTION TO MUMPS
	J **SOFTWARE** Trianon, NYH	● PROGRAMMMING LANGUAGES ●				J11-12 *Edward Miller* AUTOMATED SOFTWARE TESTING AND EVALUATION		J13-14 *Paul Schneck* WHY (OR IF) FORTRAN WILL SURVIVE	
		Harbert Maisal J7-8 PROGRAMMING LANGUAGE DESIGN		*Paul Oliver* J9-10 PROGRAMMING LANGUAGE STANDARDS: SUCCESSES AND DISAPPOINTMENTS					
	K **COMPUTER SCIENCE** Gramercy, NYH	K7-8 *Enriqua Ruspini* APPROXIMATE REASONING AND APPROXIMATE ALGORITHMS		K9 *John McLeod* ENERGY MODELS	K10 *Roger M. Firastona* COMPUTING PHYSICS	● MATHEMATICAL PROGRAMMING ●			
						Patricia J. Eberlain K11 ALGORITHMS FOR UNCERTAIN FORMS	*Jean-Paul Jacob* K12 SIMULATION VS. MATHEMATICAL PROGRAMMING	*Darwin Klingman* K13-14 OPTIMIZATION OVER GRAPHS AND NETWORKS	
	L **APPLICATIONS OF COMPUTER SCIENCE** Royal A, AM	● COMPUTER GRAPHICS ●				● COMPUTER STUDIES IN THE HUMANITIES ●			
		Stephen Levina L7 SOUND — ANOTHER DIMENSION IN COMPUTER GRAPHICS	*Josaph Scala* L8 TEACHING THROUGH COMPUTER GRAPHICS	*Richard Spaar* L9 COMPUTER GENERATED FILMS	*Jackie Potts* L10 COMPUTER GRAPHICS SOFTWARE	*Joseph Raban* L11 COMPUTERS IN MUSICAL & HISTORICAL RESEARCH	*Naomi Sager* L12 COMPUTATIONAL LINGUISTICS	*A. K. Joshi and C. Rieger* L13-14 NATURAL LANGUAGE PROCESSING	

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PLENARY SESSIONS

The '76 NCC will include four special plenary sessions open to all conference attendees. Each will be held in the Grand Ballroom of the New York Hilton Hotel and will feature major presentations on issues of particular relevance to the computing field, and to concerned members of the business community and the general public.

Keynote Address
Monday, June 7
10:15 a.m.
J. Paul Lyet
Chairman of the Board
Sperry Rand Corporation

International Plenary Session
Monday, June 7
1:15 p.m.
Chairman: Bob O. Evans
President
IBM System Communications Division
Sessions Participants
Professor A. S. Douglas, University of London
Dr. Anatoly A. Dorodnicin, Academician and Director of Computer Systems, USSR Academy of Sciences, Moscow
Dr. Heinz Zemanek, Director of IBM Laboratory, Vienna
Shiro Omata, President, Nippon Univac Kaisha, Ltd., Tokyo

The Computer Profession
Tuesday, June 8
1:15 p.m.
Chairman: Dr. Ruth M. Davis
Director, Institute for Computer Sciences and Technology
National Bureau of Standards
Featuring:
AFIPS Presidential Address
Dr. Anthony Ralston

Public Policy and Computers
Wednesday, June 9
1:15 p.m.
Chairman: Janice C. Lipsen
President, Counselors for Management, Inc.
Featured Address
To be Announced

NYH = NEW YORK HILTON
AM = AMERICANA

CONFERENCE AT A GLANCE

		1	2	3	4	5	6
		MONDAY AFTERNOON		TUESDAY MORNING		TUESDAY AFTERNOON	
		2:30 pm - 4:00 pm	4:15 pm - 5:45 pm	8:30 am - 10:00 am	10:15 am - 11:45 am	2:30 pm - 4:00 pm	4:15 pm - 5:45 pm
COMPUTERS AND PEOPLE	A **SOCIETAL CONCERNS** Sutton, NYH	*Saul Padwo* A1-2 WORLD ENVIRONMENT FOR DATA PROCESSING		● DATA SECURITY ●			
				Eldred C. Nelson A3 DATA SECURITY IN THE DOD	*Rain Turn* A4 DATA CRYPTOGRAPHY	*Naomi Sallgman* A5 DATA SECURITY IN INDUSTRY	*Dannis K. Branstad* A6 SECURITY IN COMPUTER NETWORKS
	B **COMPUTER PROFESSION** Royal B, AM	*Margarat Fox* B1 25 YEARS OF JOINT COMPUTER CONFERENCING	*Walter Anderson* B2 INFORMATION PROCESSING IN THE YEAR 2000	*Anita J. Cochran* B3 COMPUTING IN EUROPE	● PIONEER DAY ●		
					John G. Brainard B4 ORIGINS OF ENIAC	*Harman Goldstina* B5 DEVELOPMENT OF ENIAC	*Richard E. Merwin* B6 POST-ENIAC TRANSFER OF TECHNOLOGY
	C **ISSUES IN COMPUTING** Imperial B, AM	*Ronald A. Frank* C1 ROLE AND OBLIGATIONS OF THE TRADE PRESS	*H. W. Bomzer* C2 DATA PROCESSING CAREER PATHS	● PUBLIC ACCESS TO COMPUTERS ●			
				Janet Kiehl C3 PUBLIC ATTITUDES TOWARD COMPUTERS	*Evelyn R. Murphy* C4 PERSONAL COMPUTERS	*David H. Ahl* C5-6 PUBLIC ACCESS TO COMPUTER POWER	
	D **APPLICATIONS SERVING PEOPLE** Grand Ballroom East, NYH	*Genevieve Greenwald-Katz* D1-2 COMPUTERS IN ARCHITECTURE		● CRIMINAL JUSTICE SYSTEMS ●			
				Bernice Pantell D3-4 THE ALEMEDA COUNTY LAW ENFORCEMENT SYSTEM OF THE FUTURE		*Thomas J. Madden* D5-6 CRIMINAL JUSTICE INFORMATION SYSTEMS AND USE OF CRIMINAL RECORDS	
SYSTEMS	E **COMPUTER SYSTEMS** Grand Ballroom West, NYH	●		COMPUTER SYSTEM DESIGN ●			
		John C. Davis E1-2 STORAGE SYSTEMS		*Nancy Betz* E3 INTERACTIVE SYSTEMS	*Stephen S. Yau* E4 COMPUTER SYSTEMS RELIABILITY AND MAINTAINABILITY	*Garald Estrin* E5-6 MODULAR COMPUTER DESIGN	
	F **SYSTEMS MANAGEMENT** Mercury, NYH	● COMPUTER		SYSTEM MANAGEMENT AND PLANNING ●			
		John V. Soden F1-2 LONG-RANGE PLANNING FOR COMPUTER USAGE IN LARGE ORGANIZATIONS		*Edward O. Joslin* F3-4 ECONOMIC REQUIREMENTS AND WORKLOAD ANALYSIS: ESSENTIAL ELEMENTS OF SYSTEMS ANALYSIS		*David S. Alberts* F5 ECONOMICS OF SOFTWARE QUALITY ASSURANCE	*David S. Albarts* F6 FUTURE DIRECTIONS IN SOFTWARE QUAL. ASSUR.
	G **NETWORKING** Imperial A, AM	*Petar E. Jackson* G1 LEGAL & REGULATORY TRENDS IN COMPUTER COMMUNICATION	*Ira Cotton* G2 PROTOCOLS FOR COMPUTER NETWORKS	*Franklin F. Kuo* G3 PACKET RADIO & SATELLITE NETWORKS	*Robert E. Kahn* G4 PROGRESS IN PACKET NETWORK INTERCOMMUNICATION	*Louis Pouzin* G5 INTERACTIONS BETWEEN PRIVATE & PUBLIC DATA NETWORKS IN EUROPE	G6 (SEE "SECURITY IN COMPUTER NETWORKS" ABOVE.)
	H **BUSINESS AND INDUSTRY SYSTEMS** Georgian B, AM	*Carol Johnson* H1 ENHANCING LIBRARY SYSTEMS	*Greg E. Mellen* H2 AIR TRAFFIC CONTROL	● WORD PROCESSING & OFFICE AUTOMATION ●			
				Harvay L. Poppel H3 COMMUNICATIONS, COMPUTERS & WORD PROCESSING	*David Farber* H4 COMPUTERIZED MESSAGE SYSTEMS	*Howard L. Morgan* H5-6 WORD PROCESSING & OFFICE AUTOMATION	
SCIENCE AND TECHNOLOGY	I **COMPUTER & DATA BASE ARCHITECTURE** Gaorgian A, AM	*Noah S. Prywes* I1 IMPACT OF AUTO. OF SYST. DESIGN ON DATA BASE ARCHIT.	*Liba Svobodova* I2 COMPUTER STRUCTURE	● COMPUTER ARCHITECTURE ●			
				Yaohan Chu I3-4 HIGH LEVEL LANGUAGE COMPUTER ARCHITECTURE		*Anna M. Gulick* I5 MULTIPROCESSING	*Tomlinson Rauschar* I6 DEVEL. APPLIC. ORIENTED COMPUTER ARCHITECTURE
	J **SOFTWARE** Trianon, NYH	*Margarat Butler* J1 SOFTWARE SHARING	*Alan G. Merten* J2 TRANSFERABILITY OF APPLICATION PROGRAMS & DATA BASES	● SOFTWARE DESIGN & ENGINEERING ●			
				Edward Yourdon J3-4 STRUCTURED DESIGN		*Raymond T. Yah* J5-6 SOFTWARE ENGINEERING — WHAT TO EXPECT IN THE NEXT DECADE	
	K **COMPUTER SCIENCE** Gramercy, NYH	*Nathaniel Macon* K1-2 COMPUTER ARITHMETIC AND NUMERICAL METHODS		*James S. Ketchel* K3 TECHNOLOGICAL FORECASTING	*Joyce A. Amenta* K4 SOFTWARE FOR SYSTEMS	*Murray Turoff* K5-6 IMPLEMENTATION OF COMPUTERIZED CONFERENCING SYSTEMS	
	L **APPLICATIONS OF COMPUTER SCIENCE** Royal A, AM	●		ARTIFICIAL INTELLIGENCE ●			
		Saul Amaral & Edward Feiganbaum L1-2 APPLIC. OF ARTIFICIAL INTELL. TO SCIENCE & MEDICINE		*Iris Kameny* L3-4 INFERENCE SYSTEMS AND SPEECH RECOGNITION AND UNDERSTANDING		*Marvin Minsky & Seymour Papert* L5 ARTIFICIAL INTELLIGENCE & EDUCATION	*Leonard Friedman* L6 THE PRESENT AND FUTURE OF MOBILE ROBOTS

Replace your IBM 3270's and save up to 55%. Then...add online editing and validation to reduce mainframe load. Add disc storage for concurrent access of local files. Add COBOL for local processing of batch and transaction based applications. And still pay less than you would for an IBM 3270 Display System alone.

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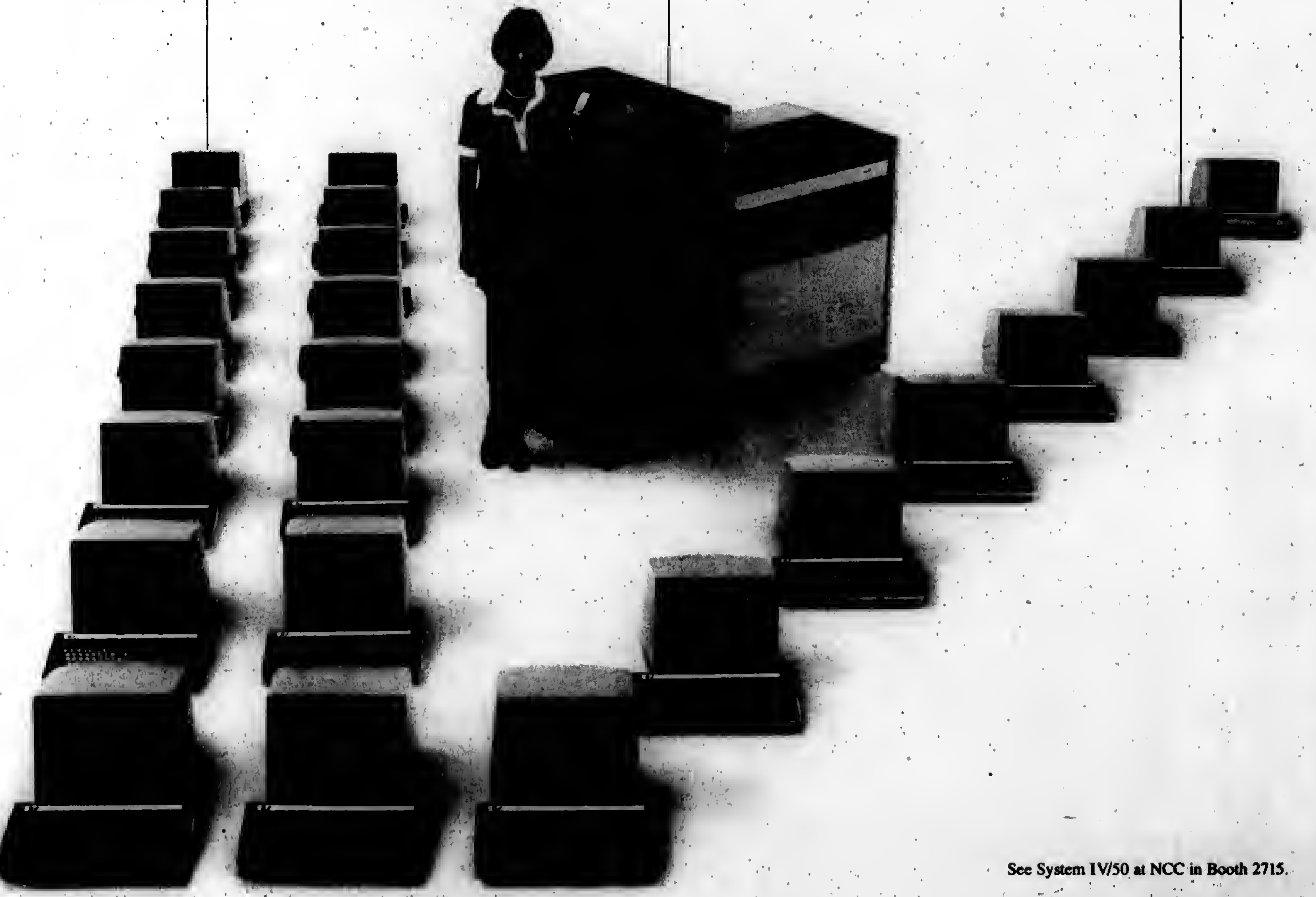

System IV/50 supports up to 48 devices including 24 1920-character displays plus a mix of character and line printers.

24K-96K byte CPU with 2.5M-270M bytes of optional disc storage.

System IV/50 displays can replace installed IBM 3270's with no change in existing cables or connectors.

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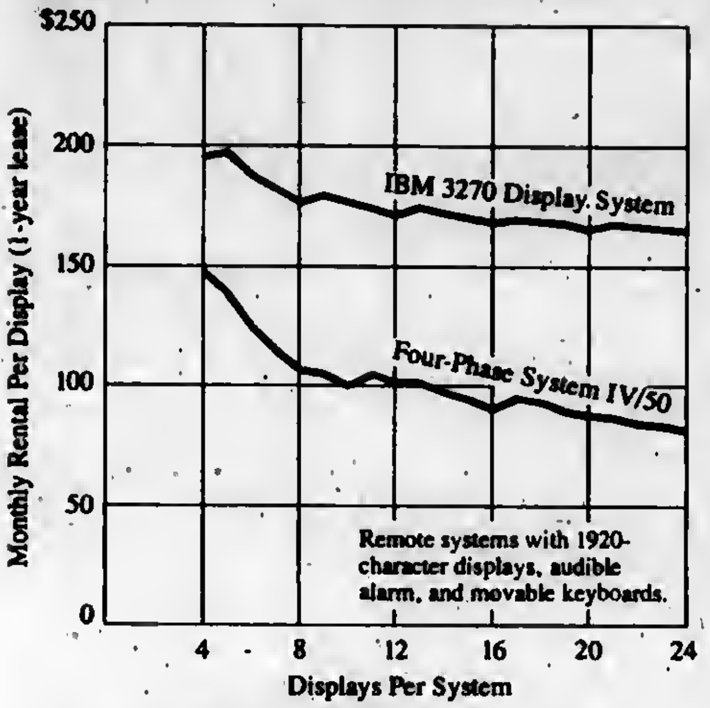

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Four-Phase 3270 replacements are online *now* with all System/370 models from the 135 to the 168. With DOS, OS, and VS. With CICS, IMS, and TSO. And with IBM ICA's, 2701's, 3704's, 3705's and their plug-compatible replacements.

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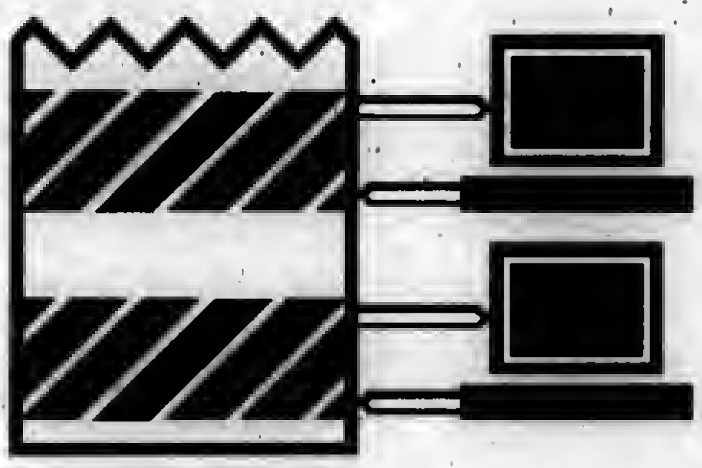
Advanced video architecture speeds program development.

System IV/50 programming is simplified by a display oriented architecture... and a COBOL compiler that makes the most of it.



Operator displays serve as windows into System IV/50 memory where screen data is stored. Data in these areas is displayed automatically and can be manipulated directly by COBOL procedure statements *without I/O transfers*.

Keystrokes are processed by software as they are entered, so editing and validation can be performed on a keystroke-by-keystroke basis.

Complementing this design is STARTER—a parameter driven formatting package that lets COBOL programmers write interactive applications as easily as batch.

With STARTER, formats are created off-line from the keyboard with free-form positioning of prompts, headings, and entry fields. Many basic edits are already built in.

As a result, format development, test, and modification are program independent.

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System IV/50 is supported by a wide spectrum of software for Network Transaction Processing. A choice of no-charge packages lets you grow at your own rate from remote data entry and display to remote data processing and remote data management... all on the same system.

At one end of the spectrum NTP/100 simulates the IBM 3270 with all transaction processing performed by the central mainframe.

At the other end of the spectrum NTP/200 supports stand-alone COBOL applications with all transaction processing performed by System IV/50.

Other NTP systems combine COBOL transaction processing with concurrent inquiry or batch communications.

Enhanced 3270 Simulator. NTP/100 provides all 3270 keyboard functions and editing features—plus local format storage for improved display response, a Store-and-Forward Mode for backup, and built in diagnostics to pinpoint network troubles quickly.

2780/3780 Simulator. NTP/130 is a programmable remote batch system that features disc spooling.

Programmable 3270 Simulator. With NTP/150 you get all the features of NTP/100—plus COBOL programming for custom enhancements. Use it to edit keyboard entries at the source, validate data against local system files, integrate data from these files with keyed entries for transmission... or with received data for display or printout, and to spool print files for increased operating flexibility.

Stand-alone COBOL. NTP/200 is a display oriented COBOL that lets you distribute processing power anywhere... without impacting your central operation.

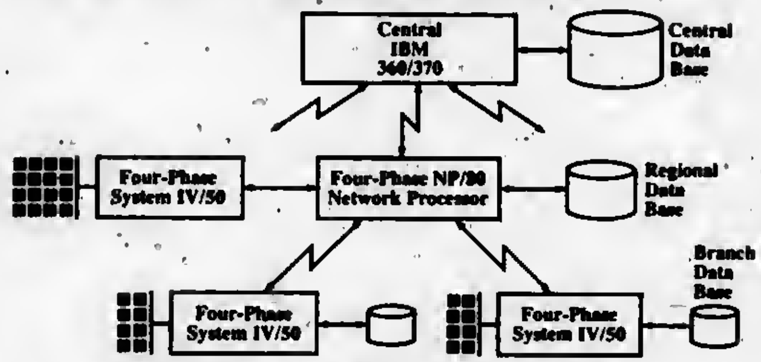
COBOL with 2780/3780 Access. NTP/230 is a display oriented COBOL with batch communications to your central mainframe or other remote systems.

COBOL with 3270 Access. NTP/250 is a display oriented COBOL that communicates with your central mainframe using IBM 3270 protocol... but without the restrictions and overhead associated with 3270 formatting and device dependent control logic.

Grow to hierarchical networks of any size or complexity.

Four-Phase's NP/80 Network Processor complements System IV/50 by meeting the communications and data base management requirements of large regional and district sites.

System IV/50 can access an NP/80 data base of up to 270 million bytes through direct channel connection. While communicating with your central mainframe at speeds up to 50K baud, the NP/80 can concurrently control a network of remote System IV/50's over multiple lines.



The heart of the NP/80 is a powerful computer with up to 256K bytes of LSI memory—*the first in the industry with 16K-bit RAM's*.

At Four-Phase we design and manufacture not only the displays and computers employed in System IV/50, but also the LSI devices used in it. Not because making semiconductors is our business. But because producing the most advanced distributed processing systems is.

To learn how System IV/50 can help your organization improve business efficiency and reduce operating costs, phone our local branch office today.

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Four-Phase Systems

Advanced Technology for Distributed Processing

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Yes, I want to know more about the new System IV/50.

Mainframe ______________________ No. and type of terminals ______________________

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Company ______________________

Address ______________________

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Per Sci Drive Ready for Show

NEW YORK – The Model 270 dual diskette drive from Per Sci, Inc. will be exhibited at Booth 1642.

The 270 is fully IBM-compatible and can accommodate 3.8M bits of data per drive (1.9M bits on each diskette) in IBM 3740 format, the firm said.

In non-IBM hard- or soft-sectored formats, the drive will store up to 6.4M bits of data on two diskette media, it added.

The drive has a voice coil positioning system which the firm claimed can facilitate a random average seek in 33 msec.

The all-DC Model 270 is fully compatible with existing systems designed for stepper motors, Per Sci said.

The 270 is priced at $880 in 50-unit quantities, the firm said from 4087 Glencoe Ave., Marina Del Ray, Calif. 90291.

Peripherals at NCC

Gould Highlights Printer/Plotter

NEW YORK – Two products from Gould, Inc. – a wide-bed electrostatic printer/plotter and a portable data logger/reader – will debut at Booths 2813, 2815 and 2817.

The printer/plotter, the Gould 5105, features a writing system that produces high-density images and smooth line contours from computer-generated graphics and alphanumerics, the firm said.

The 5105 was designed for high-speed plotting of computer graphics in scientific and engineering applications such as seismic data recording, mapping, computer-aided design and architectural and engineering drawings, Gould said.

The unit can plot 22- by 34 in. in approximately 11 sec, it claimed.

The Gould 6100 data logger/reader collects, digitizes and stores low-frequency data on magnetic tape for subsequent processing.

Severe Environments

It was designed for use in severe environments such as those found in mobile, marine, airborne and field applications, the company noted.

The 6100 can accept two 8-channel scanner cards and has six scanning rates and five recording periods, Gould said. Options are available to increase the logger/recorder's capabilities and utility, the vendor added.

The Gould 5105 is priced at $15,500, the Gould 6100 has a base price of $3,750. Gould is at 3631 Perkins Ave., Cleveland, Ohio 44114.

A micro-size message from Rodney Dangerfield
DRY COM
COM GRAPHICS

I tell you, I always had respect for computers! But now I got respect for 3M COM! Look at this! Totally dry COM on one side...low-cost COM graphics on the other! Nobody else has got either one! 3M must be driving their competitors nuts!

Want the convenience of COM right in your computer room? Get 3M LBR, the only totally dry COM. No liquids, no chemicals because LBR uses amazing laser beam technology.

Want pie charts, bar charts, and graphics on microfilm—to make data easier to understand and decisions easier to make? Get a 3M Beta System. It's the only low-cost COM with built-in graphic capability.

Want COM that converts print tapes to microfilm without heavy programming? 3M's mini-computer-controlled Beta System offers that, too. Conversion is easily accomplished, with simple operator-entered job parameters. Find out more. Write Microfilm Products Division, 3M Company, St. Paul, MN 55101 for full details on LBR and Beta COM—and 3M's full range of software and support services.

3M COMPANY

Japanese Products Expected on Stage

NEW YORK – A variety of products ranging from card verifying punches to a high-speed multifax unit will be exhibited by the Japanese firm, Tokyo Juki Industrial Co., Ltd., at Booth 3240.

The Model 1504 card verifying punch, which can punch, verify, print and interpret, and the Model 1504-AP card verifying punch with aperture card features will be shown.

Two dot matrix printers, the 5701 and 5703 will also be displayed. The 5701 has a single head, the 5703 a dual head.

The firm will also show a card reader, the Model 2603-RJ, which reads punch and mark cards and is equipped with a Miss-Card Reject Feature.

Other products will include the Model 3001 photoengraver, which engraves portraits on plastic cards; the Model 1820 data recorder; the Model 1830, a disk-tape data converting adapter; and the Model 100-A, a high-speed multifax or radio facsimile equipped with band compression modem FAM-1, the company said.

Tokyo Juki is at 23 Kabuki-cho, Shinjuku-Ku, Tokyo, Japan.

Voice Response Units To Be Demonstrated

NEW YORK – The Vocal Interface Division of Federal Screw Works will show several of its Votrac voice response units at Booths 3327 and 3329.

One will be the LV-50 voice annunciator, which uses the Vodis-I computer system to convert analog audio signals into digital bit patterns.

The low data requirement of this process permits the use of programmable read-only memories as storage media, the vendor said. This in turn could allow the use of solid-state digitally stored vocabulary by users with a low volume of changing vocabulary requirements, it added.

In addition to English, the ML-1 multilingual voice system to be displayed can speak German. Other languages, such as Spanish, French, Japanese and Persian, are presently under consideration for development, the firm said.

The ML-1 is programmed to speak based on phonetic coding principles; utterances are spelled phonetically to produce all combinations of words and phrases required by the application, the company said, adding there is no limit to the amount of vocabulary the ML-1 can produce.

The company is at 270 Concord St., Framingham, Mass. 01701.

Storage Units in Limelight

NEW YORK – National Semiconductor Corp. will display three memory storage products at its exhibit in Booth 3220.

The products are the NS21 memory storage card with a 16K-word memory; the NS3000-1 memory card, also with a 16K-word memory; and the NS3 bulk storage memory unit with a capacity of 256K bytes.

National Semi is located at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Tape Message Displays Set

NEW YORK – Texas Digital Systems, Inc. will exhibit its tape message display units at Booth 2106.

The display units have 16-character message formats with programmable blink capabillty and a 64-character alphanumeric set, Texas Digital said.

The company can be reached through P.O. Box 3701, Bryan, Texas 77801.

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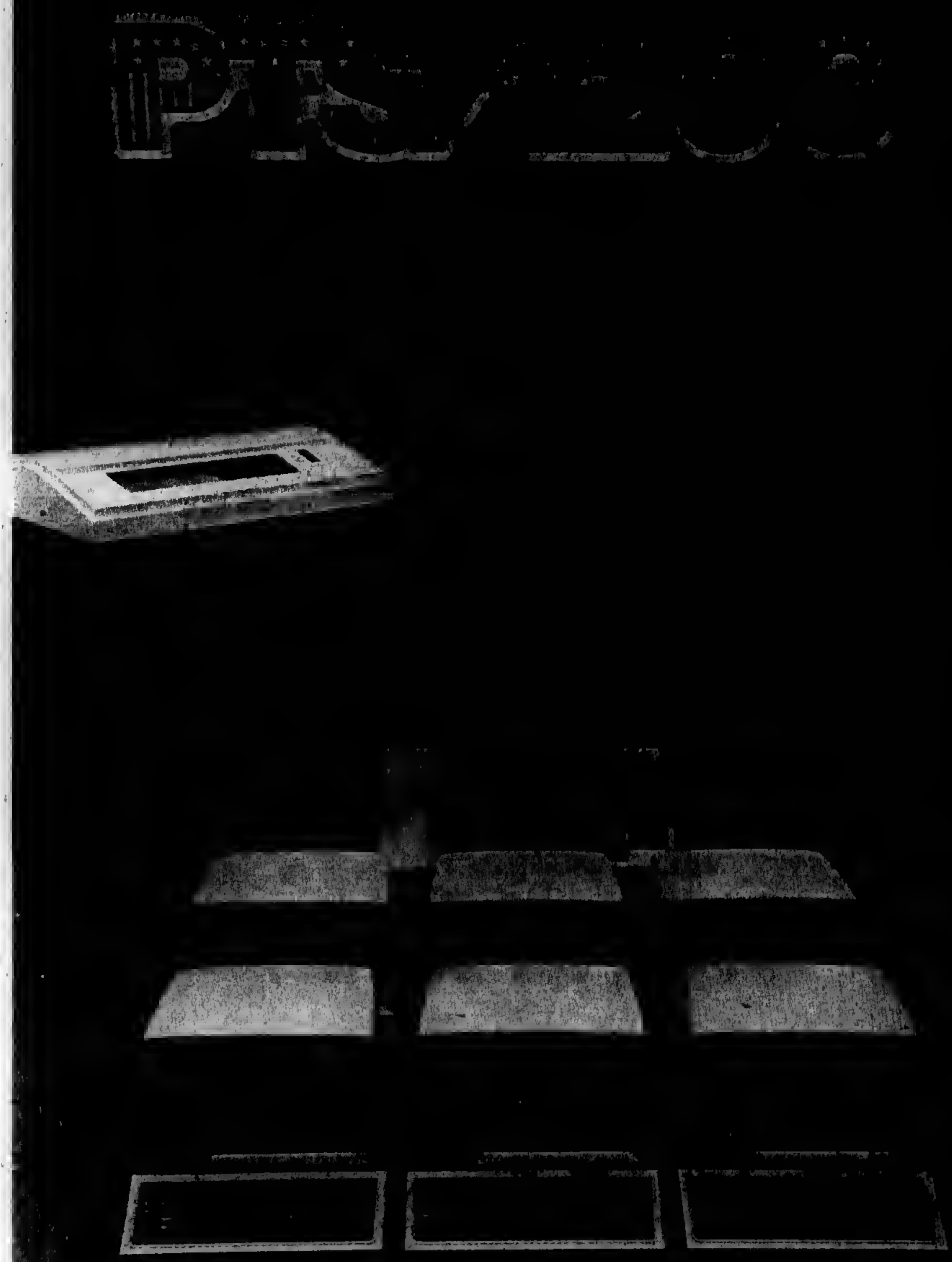

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the Word gets around.

RAYTHEON DATA SYSTEMS

RAYTHEON

Interdyne Starting Family

NEW YORK – The Interdyne Co. will introduce the IC 1300, the first model in its Unireel family of digital recorders, to NCC attendees at Booth 2635.

The Unireel concept combines a single-reel magnetic tape package that is smaller than cassettes or cartridges with a small, self-threading tape drive, the company said.

The Unireel 150, a package of tape has a 2-1/8 in. diameter, weighs 1 oz and contains 140K bytes of information, Interdyne said.

Unireel 150s are loaded into the Unireel 1300 tape drive with a straight line "slot-loading" motion; the drive automatically threads the tape into a captive takeup reel and positions the tape, the company added.

Prices and delivery dates have yet to be announced by the firm at 14761 Califa St., Van Nuys, Calif. 91411.

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Starvvue Also on View

Oracle to Appear at Kodak Exhibit

NEW YORK – Eastman Kodak Co.'s recently introduced Oracle microfilmer and retrieval terminal and Starvue reader and reader/printer will highlight its exhibit at Booth 2132.

The company will also display three other products: the KOM-80 microfilmer, the Recordak Reliant 700 microfilmer and the Ektalite 234 reader.

The Oracle microfilmer and retrieval terminal provides random access of documents by means of a digital code exposed on the film.

It was designed "for microfilm applications where complex coding is not required, but where rapid selective retrieval is necessary for business efficiency," Kodak said.

The Oracle has the capability to directly access film encoded with an 8-digit code at the base of the document image, the company added.

The Starvue reader and reader/printers were designed to handle varying film requirements and reduction ratios, Kodak said.

Eastman Kodak is at 343 State St., Rochester, N.Y. 14650.

Megatek Graphics Generator to Bow

NEW YORK – Megatek Corp. will introduce the 76X graphics generator, said to be capable of refreshing over 4,000 vectors, points or characters with full-screen resolution of ±.05% at Booths 1807 and 1809.

The unit refreshes from internal memory to eliminate CPU loading, the company said.

Features of the 76X include dynamic graphic capabilities, real-time clock, hardware jump-subroutine and relative vectors; 16 levels of intensity control; Ascii keyboard; translation; and rotation, it added.

The 76X is priced "under $8,000," according to Megatek, which is at 1055 Shafter St., San Diego, Calif. 92106.

Megatek 76X

Peripherals at NCC

Okidata Putting Printers on Display

NEW YORK – Okidata Corp. will be demonstrating both its 132-column printer and its document/passbook printer at Booth 2301.

The 132-column matrix printer, which sells for $1,700, comes in either desk-top or pedestal-mounted versions and produces 5 by 7 matrix characters at 125 line/min or 265 char./sec, Okidata said.

It is available with parallel and RS-232 serial interfaces, the firm said.

The printer features an Ascii character set, full upper- and lower-case characters and 6- or 8 line/in. operation.

The CP210 document/passbook printer, which prints 65 line/min, was designed for remote terminal systems.

Featuring upper- and lower-case characters, the CP210 is configured for shared use by two operators with separate controls for each, the firm said.

Okidata is at 111 Gaither Drive, Moorestown, N.J. 08057.

Encyclopedia Set

NEW YORK – Mason/Charter Publishers, Inc. will show its *Encyclopedia of Computer Science* in Booth 2017.

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Source 7600 Device to Make Appearance at MSI Booth

NEW YORK – The Source 7600, a programmable, off-line data terminal, will highlight MSI Data Corp.'s exhibit at Booth 1717.

MSI Source 7600 Terminal

The source data entry workstation interfaces with either in-house or contracted computer service centers and approaches the input/output performance of on-site minicomputer systems, remote batch terminals and other on-line data input terminals, MSI said.

Peripherals at NCC

The terminal incorporates an Intel 8080 microprocessor which is permanently programmed with a full set of basic programming commands, according to the firm.

'Free · Form' Mode

A "free form" mode also allows the terminal to accept and then transmit narrative, unformatted data, the company added.

One cassette drive is standard with the terminal; a second is optional. The 7600 includes a full typewriter keyboard, a separate accounting-style 10-key touchpad and a 32-position LED display that permits the operator to edit each line of data while it is still buffered, MSI said.

Source 7600 inputs are received at the computer center by MSI's Data System IV, which records all inputs on magnetic tape for subsequent input into the host CPU, according to the company.

The terminal is priced from $3,500 to $4,500, depending upon options. MSI is at 340 Fischer Ave., Costa Mesa, Calif. 92627.

Intelligent Digitizer on View

NEW YORK – The Intelligent Digitizer, which features a built-in microprocessor, will be shown by Summagraphics Corp. in Booth 1826.

The unit is self-calibrating and all modes – point, stream and remote – may be operated incrementally; that is, X-Y data is output only when the value changes.

The microprocessor allows stand-alone operation of the Intelligent Digitizer, which also features a front panel switch that permits user selection of origin anywhere on the tablet surface, the vendor said.

Interfaces are available to link the digitizer with minicomputers, calculators, communications devices, keypunches and magnetic tape transports, Summagraphics said.

The company is at 35 Brentwood Ave., Fairfield, Conn. 06430.

ITC Announces Entry Of Three Cassettes

NEW YORK – Information Terminals Corp. (ITC) will introduce three products at Booths 3519 and 3521.

The H Series of high-reliability cassettes is certified to be dropout-free and operates over a temperature range of -50°F to 150°F, ITC said.

The MI-50 mini cassette was designed for applications such as microprocessor program loading, word processing, minicomputer storage and hand-held terminals. Each cassette is priced at $6 in quantities of 100.

The TK-100 cassette test kit provides an aid in aligning cassette transports, measuring tape tension and cassette torques. It can be used with any Philips-compatible cassette, ITC said, and costs $1,050.

ITC is at 323 Soquel Way, Sunnyvale, Calif. 94068.

Danish Company Displaying Tape Punch, Reader Line

NEW YORK – GNT Automatic, Inc., a Danish firm, will display its line of paper tape punches and readers and introduce two products at Booth 3114.

Included in the exhibit will be the paper and Mylar tape models 3406 and 3424 punch stations, the table-top Model 34 punch, the Model 34T punch mechanism, the Model 42 reader/punch combination and the complete Model 26 reader program.

The Model 3406 punch and Model 26Cl reader will be introduced. The 26Cl is a unidirectional 550 char./sec reader, primarily intended for use as an input device for minicomputers.

The 3406 utilizes a spooling system which allows the tape to wind itself automatically.

GNT Automatic can be reached at 440 Totten Pond Road, Waltham, Mass. 02154.

Diagnostic Instrument Bows

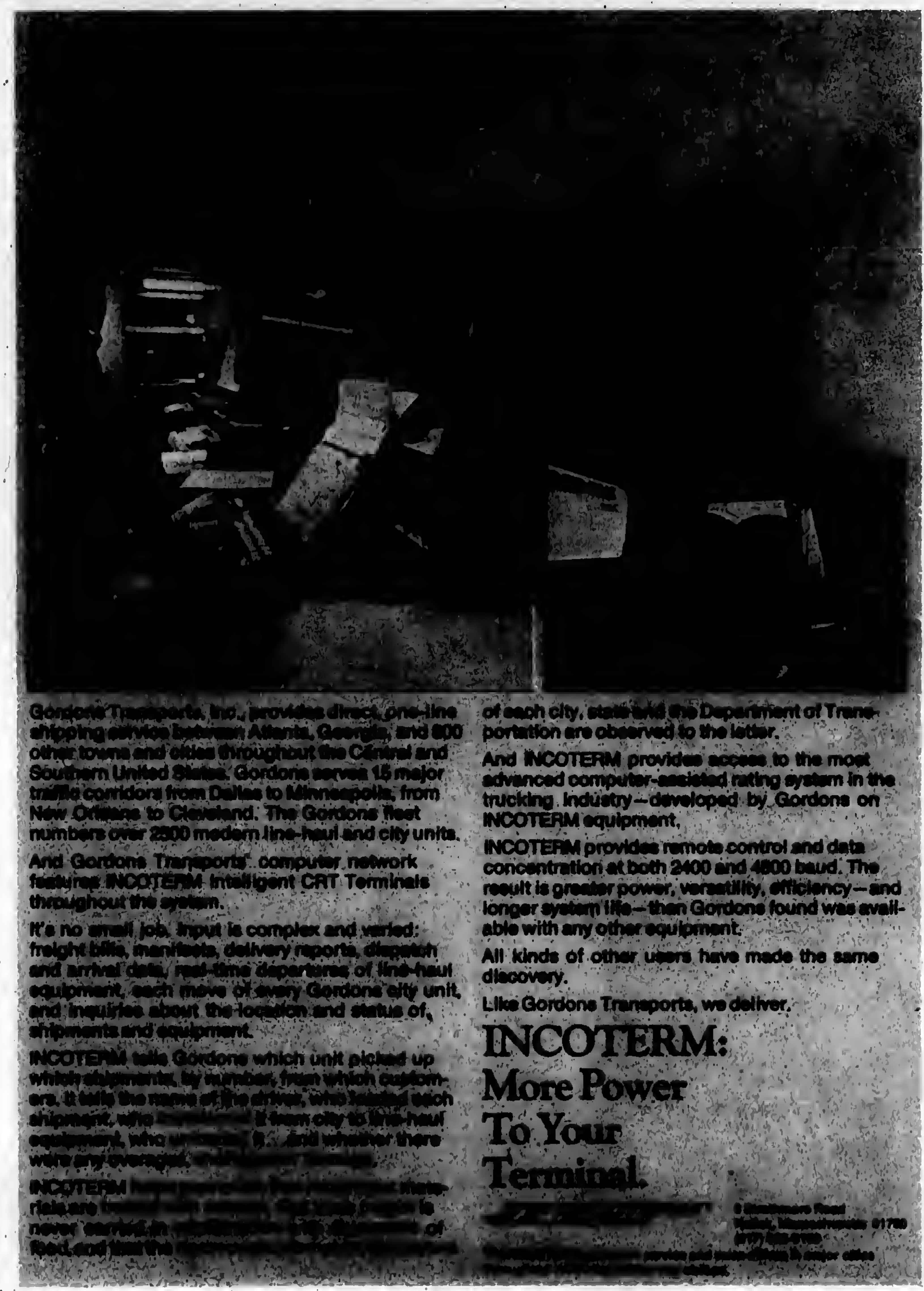
NEW YORK – Vu-Data Corp. will introduce its Model PS915/975, a digital multimeter, frequency counter and oscilloscope in a single unit with its own displays, at Booth 2019.

The diagnostic instrument is priced at $1,250 from the company at 7170 Convoy Court, San Diego, Calif. 92111.

Deltak Showing Courses

NEW YORK – Deltak, Inc.'s multimedia training courses on subjects such as TSO, IMS, PL/I, structured programming and structured design will be on display in Booth 3400.

Deltak is at 9950 W. Lawrence Ave., Schiller Park, Ill.



Gordons Transports, Inc., provides direct, one-line shipping service between Atlanta, Georgia, and 800 other towns and cities throughout the Central and Southern United States. Gordons serves 15 major traffic corridors from Dallas to Minneapolis, from New Orleans to Cleveland. The Gordons fleet numbers over 2500 modern line-haul and city units.

And Gordons Transports' computer network features INCOTERM Intelligent CRT Terminals throughout the system.

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Emerson Planning Demonstration Of Series 2000 Tape Pac System

NEW YORK – The Industrial Controls Division of Emerson Electric Co. will demonstrate the Series 2000 Tape Pac system at Booths 1218 and 1220.

The Series 2000 is a magnetic tape system that is said to offer improved tape handling and media protection.

Standard System

The standard Tape Pac system consists of a Model 2005 tape drive and a Model 2004 Tape Pac; the system is plug-compatible with conventional tape drives using standard tape formatters, Emerson said.

Speeds and Densities

The tape drive has a read/write speed of 25 in./sec and recording densities from 200- to 3,200 bit/in. according to the firm at 3300 S. Standard St., P.O. Box 1679, Santa Ana, Calif. 92702.

Taurus to Exhibit Heavy-Duty Readers

NEW YORK – Taurus Corp. will exhibit its line of heavy-duty industrial serial and static punched card readers at Booth 1815.

The serial card reader that will be featured has 168 options available and can be either cabinet- or rack-mounted.

The static card readers came in three sizes: 20-column, 40-column and 80-column.

Taurus is at Academy Hill, Lambertville, N.J. 08530.

Spatial Eying Meet With Image Station

NEW YORK – Spatial Data Systems, Inc. will demonstrate its digital image analyzer, the Computer Eye Image Station, at Booth 1111.

The digital picture processing terminal is said to enhance and measure aerial photographs, radiographs and microscope images as well as standard photos.

Can Act as Terminal

The Image Station provides stand-alone capabilities and also can act as an intelligent terminal to larger host computers, according to the company.

The cost of the device ranges from $20,000 to $75,000, the company said from P.O. Box 249, 508 S. Fairview, Goleta, Calif. 93017.

Voice Data Entry Unit Starred by Threshold

NEW YORK – A data entry terminal that recognizes spoken words will be displayed by Threshold Technology, Inc. (TTI) at Booth 1013.

The Threshold 500 recognizes spoken words and can be used to replace or complement CRT/keyboard stations, the firm said.

Peripherals at NCC

Output from the unit is in the same format and code as that of a standard keyboard terminal, TTI added, noting it can be used with the firm's 550 central processor in turnkey systems.

The Threshold 500 is priced at $10,500, the company said from 1829 Underwood Blvd., Delran, N.J. 08075.

General Instrument Presents Disk Memory

NEW YORK – Head-per-track disk memories will highlight General Instrument Corp.'s exhibit at Booth 1433.

The company will show its latest memory, the Model 530C, which was designed for random-access storage.

The Series 700 random-access disk drive, which will also be displayed, has a storage capacity up to 4.5M bits.

General instrument is at 13040 S. Cerise Ave., Hawthorne, Calif. 90250.

Paper Tape Punch Model Comes Out at Epson Booth

NEW YORK – Epson America, Inc. will introduce the Model 6110 paper tape punch, which operates at a speed of 50 char./sec, at Booths 1128 and 1130.

The 6110 is said to be adjustable to accommodate 5, 6 or 8 channels of 1-in. Ansi standard tape.

Epson, located at 2990 W. Lomita Blvd. in Torrance, Calif. 90505, will also demonstrate a companion 6510 paper tape reader and a card reader, line printer, micro drum memory and mini printers for use with calculators.

Graf/Pen Series Introduced

NEW YORK – Another series of Graf/Pen digitizers will be introduced by Science Accessories Corp. (SAC) in Booths 1803 and 1805.

The NT series uses pulses of sound to convert point locations or graphic line representations into digital information for data processing, recording or transmission, SAC explained.

The sonic pulses are generated by a pen, stylus or cursor in the system.

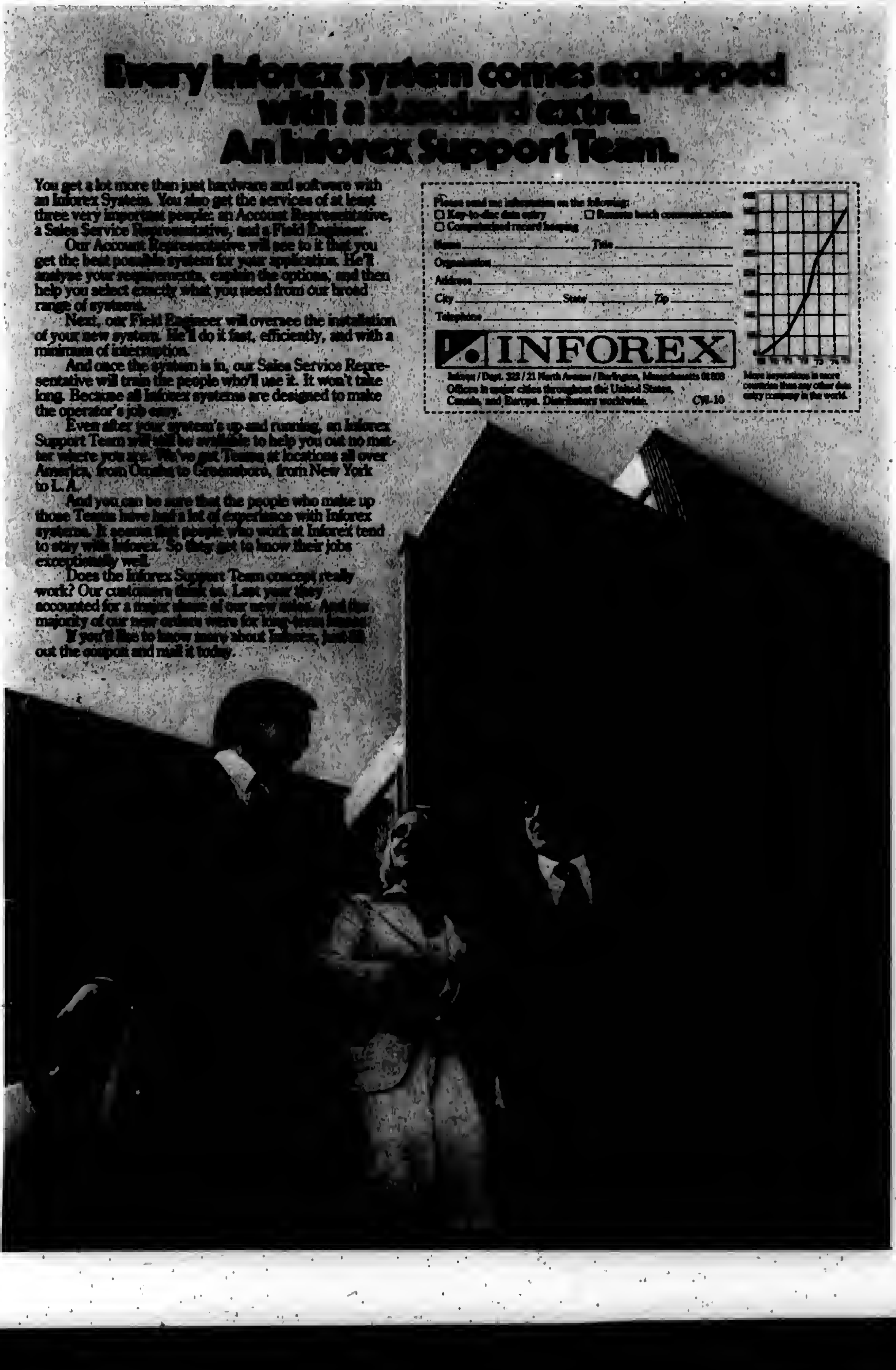
By measuring the time required for the pulses to reach two microphone/sensors, the distance of the point from each of the two sensors can be determined, SAC noted from 970 Kings Highway West, Southport, Conn. 06490.

Paper Tape Transport Bows

NEW YORK – Data Specialities, Inc. will introduce the Moduperf 75 paper tape transport that is said to offer field-replaceable modules so the operator can replace the die block and/or data selector.

The die block cuts holes for a minimum of 120 million punch cycles or 1,000 rolls of tape, the vendor said, and will punch all types of tape including Mylar, papcr, oiled, folded or rolled.

The Moduperf 75 will be shown in Booth 2117, Data Specialties said from 3455 Commercial Ave., Northbrook, Ill. 60062.



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Peripherals at NCC

System 1200 to Highlight MDS Display

NEW YORK – Mohawk Data Sciences Corp. (MDS) will demonstrate several products, including its System 1200 key-to-disk unit and System 2300 Hasp workstation, hourly at Booths 3321, 3323 and 3325.

Multiplexer Included

The System 1200 is a data entry system built around the 1204 control unit, which contains a processor, fixed-disk storage drive with controller, 32K memory, a 1/2-in. magnetic tape drive with controller, and a Keystation multiplexer.

The 2300 Hasp workstation has a 400 card/min reader and a 30 char./sec bidirectional printer featuring electronic skipping and tabbing, MDS said.

Also demonstrated will be the concurrent capabilities of the MDS System 1200. As operators enter information under control of the key-to-disk operating system, the System 2300 intellignet terminal will transmit remotely prepared transaction files to the 1200 for incorporation into the main processing stream, MDS said.

SIP to Be Shown

The company's user programmability language, SIP, will also be demonstrated. SIP allows key-to-disk users to tailor their own validation and edit routines to complement the ready-to-use software features supplied by MDS, it said.

The firm is located at 1599 Littleton Road, Parsippany, N.J. 07054.

Ampex Drive Ready For First Showing

NEW YORK – Ampex Corp.'s DM-9300, a 300M-byte model in its 9000 family of disk drives, will be demonstrated for the first time at Booth 3200, along with the DM-900 Quiet Enclosure designed for business environment operations.

The firm will exhibit its entire family of mass storage disks from 40M- to 30M bytes, all using common interfaces, a spokesman said.

"We will emphasize to OEM users that the flexibility of these field-upgradable disk drives means increased return on their investments," he added.

The DM-9300 is scheduled for mid-year delivery from the firm at 401 Broadway, Redwood City, Calif. 94063.

Tab to Feature Micro-Equipped Punch-Verifier

NEW YORK – The Model 501 microprocessor-equipped punch-verifier from Tab Products Co. will be demonstrated in various modes at Booths 2707, 2709 and 2711.

The interpreting punch-verifier was designed for 80-column card applications; it is fully buffered and has chained program selectivity, memory storage for constant data and check-digit accumulate and computation functions, Tab said.

With the addition of communications interfaces, the 501 can be switched on-line to provide punched card I/O capability, the company added.

The Model 501 can be purchased or leased under various plans. A unit with interface and maintenance costs about $8,250 or $266/mo, Tab said from 1451 California Ave., P.O. Box 10269, Palo Alto, Calif. 94303.

SMS Bringing Along Tape Label Printer

NEW YORK – An automatic label printer for computer tapes that prints at 20 labels/min will be shown in Booth 3117 by Scientific Measurement Systems, Inc. (SMS).

Information is printed on the label whenever a dismount message occurs for a newly created output tape, SMS said.

Types of Information

The information consists of such data as customer identification, volume serial number, job name, step name, date created, data set name, tape drive address, label type, sequence number, density and other customer information.

The unit can be used with IBM 360/370 systems, SMS said from 26 Olney Ave., Cherry Hill, N.J. 08003.

Texwipe Scanning Magnifier Checks Disk Pack Surfaces

NEW YORK – The happenings at The Texwipe Co.'s Booth 1224 will include the introduction of an optical scanning magnifier and the demonstration of contamination control supplies for computers and peripheral equipment.

The optical scanning magnifier was designed to check the surface condition of disk packs and can be added to the company's System 316 and System 336 disk pack inspection equipment at no additional cost.

The systems cost $1,995, a Texwipe spokesman said. The company can be reached through P.O. Box 278, Hillsdale, N.J. 07642.

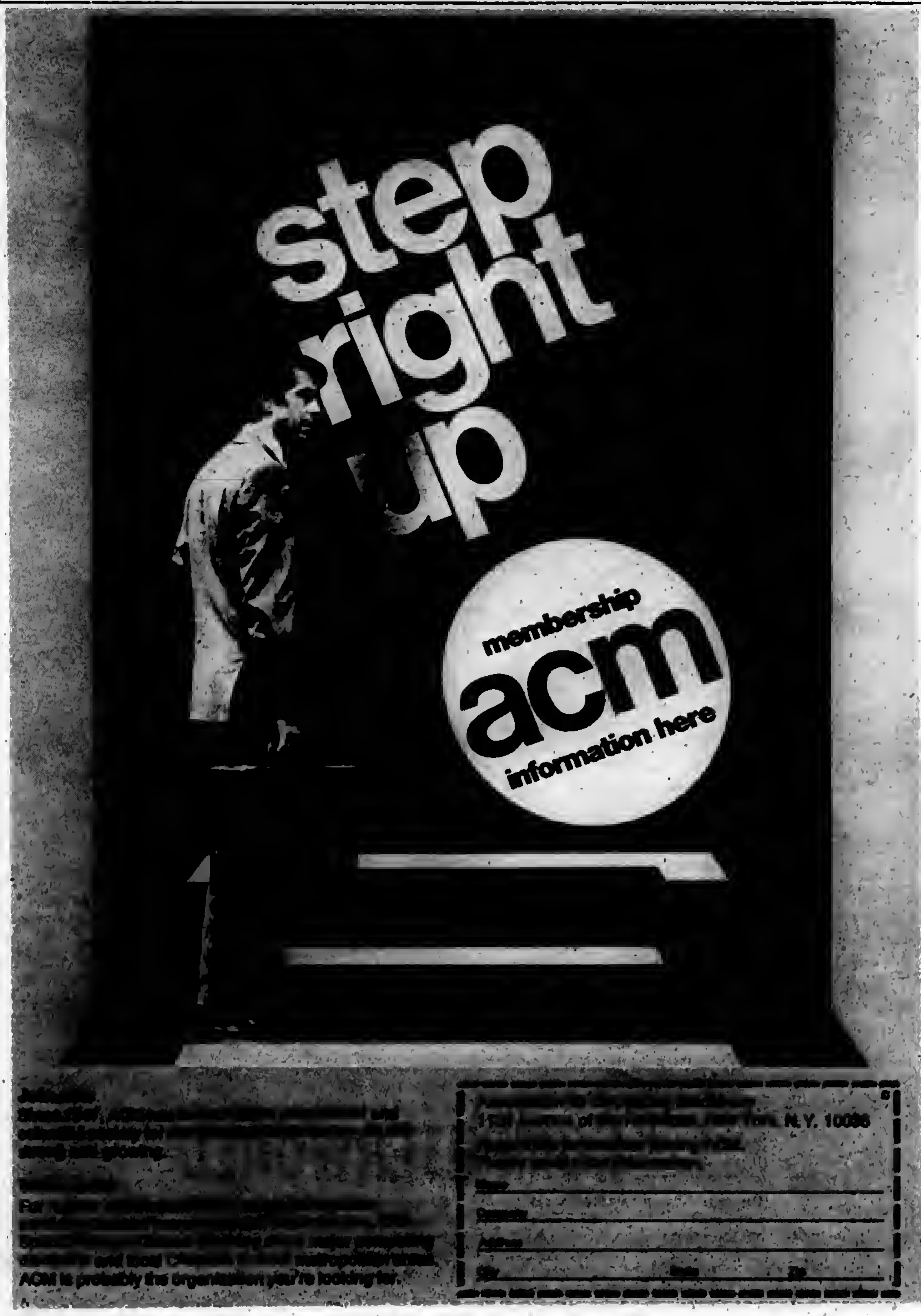
Glaser Plotter Coming

NEW YORK – A flat bed plotter and a line of plotters compatible with the Hewlett-Packard 9830 calculators will be introduced at Booth 2122 by Glaser Data Co.

The plotters accept Ascii signals; an RS-232 interface is standard, but a range of optional interfaces is available, the firm said.

The Model DP-1700 flat bed plotter offers a 44-in. by 34-in. plotting surface and has a speed of 800 increment/sec for a price of $17,000, the firm said.

Glaser is at 225 Forest Ave., Palo Alto, Calif. 94301.



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Terminals at NCC

At Booths 1122 and 1124

Datamedia Scheduling Display of Three Elite Units

NEW YORK – The Elite line of portable CRT terminals will be shown by Datamedia Corp. at Booths 1122 and 1124.

Datamedia Elite Terminal

The three models in the Elite series have a 9-in. diagonal display and a built-in 300 bit/sec coupler option, the company said.

The basic model provides a "glass Teletype capability," the mid-range unit features cursor addressability and optional lower case and the top-of-the-line version provides APL/Ascii capability.

The Elite 1520A has the ability to display 1,920 alphanumeric characters in a 24-line by 80-character format; a 64-character Ascii set; and an optional APL/Ascii switch-selectable capability, Datamedia said.

It was designed for interactive applications, data entry and information retrieval and can accommodate a standard RS-232C or optional 20/60mA current loop interface, the firm added.

The APL/Ascii Elite 1520A video terminal has a standard 128-character upper- and lower-case Ascii set and APL switch capability, the company said.

The Elite 2500A CRT terminal features a full upper- and lower-case character set and a display format of 1,920 characters.

"One of the more salient features" of the Elite 2500A, the company claimed, is its format mode capability – a dual-density display which distinguishes between foreground and background data. A "blink field" can be used to highlight important data.

Prices range from $1,250 to $1,664 for the terminals; Datamedia is at 7300 N. Crescent Blvd., Pennsauken, N.J. 08110.

DTC to Show Disk, Hywriter, Terminal

NEW YORK – The DTC-300/S terminal, the DTC-302 Hywriter and the DTC Micro File intelligent disk system will be demonstrated by Data Terminals and Communications (DTC) in Booth 3529.

The DTC-302 utilizes the Diablo Hytype I printer and a microprocessor controller. It comes in either desktop or pedestal-mounted versions.

Capable of print speeds of 45 char./sec, the DTC-302 can operate at optional data rates up to 1,200 bit/sec for a price of $3,490.

The Micro File system provides users of any RS-232-compatible data terminal with the capability to make the unit a stand-alone or remote terminal.

The unit includes a dual floppy disk drive, 8K characters of random-access memory and a dual RS-232 interface and costs $3,950.

DTC is at 1190 Dell Ave., Campbell, Calif. 95008.

Portable CRT Exhibit Feature at ASC Booth

NEW YORK – Applied Systems Corp. (ASC) will show its portable CRT communications terminal at Booth 2100.

Options are available for function electronics and a microprocessor to transform the CRT into an intelligent terminal for formatting, editing and special communications protocols, ASC said.

The unit features a 64-character, standard upper-case Ascii keyboard with an optional numeric pad; the CRT has a 256-character display in an 8-line by 32-character format.

The unit is capable of transmission speeds of 110- and 300 bit/sec, with optional speeds up to 9,600 bit/sec, ASC said from 26401 Harper Ave., St. Clair Shores, Mich. 48081.

Intertec Planning to Unveil Data-Term Devices for OEMs

NEW YORK – Intertec Data Systems Corp. will introduce its Data-Term data communications terminal for the OEM market at Booth 2807.

As standard features, the terminal includes impact printing in a 132-column width, 45 char./sec operation, 30-key alphanumeric keypad, horizontal and vertical tabs and a user-programmable character set, Intertec said.

Optional features include an APL/Ascii character set; IBM 2740 and 2741 compatibility; Intertec's micro cassette; and print speeds up to 180 char./sec.

The unit is priced at $1,300 in OEM quantities, Intertec said from 1851 Interstate 85 South, Charlotte, N.C. 28208.

Data-Term 450

The reach for speech, and other important topics in *Source Data Entry.*

A special report in the June 28th *Computerworld*.

Computers can process only the data they have access to. And the speed of your entire computer operation is necessarily dependant upon how fast you convert raw data to machine-readable form. That's why the data entry function has been the target of so many economizing measures over the years. And we've come a long way from the card and keypunch sweat shop environments of ten years ago. Key entry is no longer widely viewed as a purely clerical function for control clerks to balance or correct at a later time. Now there's a variety of systems that enable an operator to enter data, edit and validate it automatically, transmit it to the host computer and then receive the interpreted data, all with the same equipment. And we'll look at how organizations are using systems like these to increase the economy and utility of their computer operations.

Using application stories and tutorials, we'll cover the entire range of data entry, including traditional keypunch to 80- and 96- column cards, as well as key-to-tape and the much-heralded key-to-disk systems. We'll focus on the many options available in mixed media systems - with combinations like OCR and keypunch, for example. Distributed data entry has been praised by some users as "the wave of the future", and we'll cover this subject in depth.

And what's left after card, tape, disk, buffered, distributed, hybrid and OCR? Possibly Voice Data Entry, which could develop into one of the most revolutionary innovations we've seen so far. We'll emphasize user experiences with these products, and we'll analyze the incredible convenience they can bring to many applications, as well as what problems must be overcome.

In all, you'll find in-depth summary of what's being done in the eminently practical field of source data entry. And if you have an interest in data entry methods you should be reading this special supplement in the June 28th *Computerworld*. If you're a marketer in this field, here's where you should be telling your story. Ad closing date is June 11. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

COMPUTERWORLD

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Terminals at NCC

Harris Bringing Enhancements For 1600 Remote Processors

NEW YORK – Harris Corp.'s Data Communications Division will have a series of hardware and software enhancements to its 1600 family of remote communications processors at Booth 2217.

The firm's disk-based Extended Communications Operating System (Ecos) employs an architecture similar to the multiprogram operating system in mainframes, Harris said.

With Ecos, a user can operate in a multijob, multitask environment while performing data entry, remote batch, file manipulation, media conversion and local batch processing on the 1600, the firm noted.

Also featured will be the Local Batch Processing system that enables users to perform batch processing functions at the 1600 site with programs written in Cobol, Harris said.

The Key Entry Processing (KEP) system also on display allows both local and remote data entry, file update and file manipulation to be implemented through the Model 1675 CRT entry station, the firm said.

Also demonstrated will be a Remote Generalized Application Language (Regal), developed to support the KEP. Regal is said to permit the user to create his own key entry programs for source data entry, file manipulation and update.

A line of products for communications network control will also be shown, the firm said from P.O. Box 44076, Dallas, Texas 75234.

Delta 4700 Making Its First Appearance

NEW YORK – An intelligent display and storage system which includes a video display terminal and a floppy disk system will be shown for the first time by Delta Systems Corp. at Booths 2631 and 2633.

The Delta 4700 has up to 16K bytes of read/write memory and is programmable from the keyboard, the company said.

Standard features include a keyboard with a set of programmable function keys; upper- and lower-case display; and the ability to display a variety of special symbols.

The system incorporates the Delta 4500, a floppy disk system which it claimed can contain up to six drives.

A single-drive Delta 4700 costs $3,100; the display terminal and floppy disk are also available separately, Delta noted from Woodhaven Industrial Park, Cornwells Heights, Pa. 19020.

AGI Plans to Display Additions to AG 910

NEW YORK – Three terminals will be introduced by Applications Group, Inc. (AGI) at Booth 2127.

AG 90 From AGI

The AG 90 features a typewriter-style keyboard and was designed primarily for use in two-way communications between two individuals or between an individual and a computer, AGI said.

The AG 91 features a standard teletypewriter keyboard and can be used as direct replacement for a teletypewriter, the company said.

Data communications and graphics capabilities are included with the AG 95. This unit has a character set of 64 teletypewriter characters.

Each of the three units is priced at approximately $2,000. The company can be reached through P.O. Box 444, Maumee, Ohio 43537.

AJ Display Varied

NEW YORK – Anderson Jacobson, Inc. (AJ) will be exhibiting a number of its keyboard printer terminals, editing recorders, couplers and acoustic couplers at Booths 1212 and 1214.

The company will have its AJ 832 keyboard printer on hand. The unit features selectable data rates of 10-, 15- and 30 char./sec and plotting and forms handling, AJ said.

Other products out for attendee's viewing will be the AJ 630, 841 and 730 terminals; the AJ 242 coupler; and three models of acoustic couplers.

The AJ 832 is priced at $3,750; the 630 costs $2,895; and the AJ 841 is priced at $2,995 new and $995 used.

AJ is at 1065 Morse Ave., Sunnyvale, Calif. 94086.

Informer to Unveil Portable Display Unit

NEW YORK – A portable display terminal from Informer, Inc. will debut Booths 2000 and 2002.

The terminal is an addition to the vendor's P Series of portable video display terminals. This and other terminals in the line can be equipped with an RS-232 interface with the capability of sending and receiving data at rates up to 9,600 bits/sec or with a 300 bit/sec acoustic coupler, Informer said.

Pollable Unit Too

Also available from Informer is a pollable, daisy-chainable portable unit.

The company will also display its small, lightweight standard unit with a full-size keyboard and 512-character display.

The latest P Series terminal is available from the vendor at 2218 Cotner Ave., Los Angeles, Calif. 90064 for $2,080.

$4,500 worth of multi part burster for

$2,995!

New! Tab 2470 High-Speed Burster: More Work For Less Money!!

It's a work horse that costs far less than competitive models, yet offers features many don't!

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With Varied Exhibit

Data 100 Aims at OEMs, End Users

NEW YORK – Products for both end users and OEMs will be exhibited by Data 100 Corp. at Booth 2327.

End-user products will include the Model 77 remote entry system, which was designed to provide remote entry and communications capabilities for remote processing applications, the company said.

The Model 77 uses a flexible disk storage medium and allows the user to enter, edit and store data on diskette under the control of data entry software, Data 100 added.

The unit permits the operator to enter data under the control of prewritten input formats, which establishes central control of data for a network of several remote entry systems, according to the vendor.

The user also has the option of creating and maintaining application formats directly on the system, the firm added.

Other Products

Other end-user products shown will include the Model 74 distributed processing system and the Model 76 remote batch terminal.

Data 100's OEM Division will show a selection of line printers, cartridge disk drives, card readers, card punches and paper tape products.

The firm can be reached through P.O. Box 1222, Minneapolis, Minn. 55440.

Forms-Handling Units Presented by BDT

NEW YORK – West Germany will be represented by BDT Buro-und Datentechnik GmbH, which will show forms-handling devices from its product line at Booths 3305 and 3307.

Three front-feeder devices will be shown: The FF 70, FF 100 and FF 120. These provide the capability to process cut single forms and/or multiple-part form sets on all types of serial printers, BDT said.

The front feeders can be used in conjunction with BDT's FT 212 forms tractor, which will also be shown. Used together, the two units can provide the forms-handling capability for both continuous and individual forms on the same printer, BDT said.

BDT is at P.O. Box 80, D-7210 Rottweil, West Germany.

Quatro Slates Micro-Based Units

NEW YORK – A series of small, lightweight microprocessor-based magnetic card terminals, capable of sending or receiving data in synchronous or asynchronous mode, will be introduced to the U.S. market by Quatro, Inc., in Booths 2026-2028.

Designed and developed by SKS of Karlsruhe, West Germany, the units are available in five configurations, ranging from a basic read-only unit to one with five function keys, a 10-digit numeric keyboard, an eight-digit LED display and a 16-digit numeric impact printer.

Prices in OEM quantities range from $1,600 to $2,400, FOB Germany, depending on configuration. Quatro, the U.S. marketer, is at 3 Great Meadow Lane, East Hanover, N.J. 07936.

ASC Set to Display Intelligent Device

NEW YORK – At Booth 2100 Applied Systems Corp. (ASC) will display its ASC Portable Intelligent Terminal with an integrated microprocssor.

The terminal features a standard uppercase Ascii keyboard, a neon-orange alphanumeric plasma display with 256 characters in eight lines of 32 characters each, the firm said.

Terminals at NCC

The terminal uses a standard acoustic coupler, operates in full-duplex, half-duplex or local modes at speeds of 110- or 300 bit/sec. Options to 9,600 bit/sec are available, ASC said from 26401 Harper Ave., St. Clair Shores, Mich. 48081.

Graphics Display Family To Debut at Lundy Booth

NEW YORK – Lundy Electrononics & Systems will show the first member in its GD family of graphic displays at Booths 3013 and 3015.

The LGD-200 is a high-performance random scan refresh system. The system includes hardware vector and character generator that yields 9,000 characters and 8,000 in. of 2-in. vectors flicker-free; 4K by 4K addressable locations; 8K by 16 bits of self-contained buffer memory; and 220 sq. in. of usable display area, the firm claimed.

The system is priced under $40,000 Lundy said from 1 Robert Lane, Glen Head, N.Y. 11545.

RCA Showing Three Products

NEW YORK – RCA Service Co. will occupy Booth 1006 with demonstrations of the GE Terminet 30 terminal with magnetic tape; the Extel receive-only teleprinter; and the Model 33 automatic send/receive teleprinter, all of which are leased and serviced by the firm.

RCA Service Co. is in Camden, N.J. 08101.

GE Printers in Spotlight

NEW YORK – General Electric will show its Terminet 30 matrix printers and the Terminet 340 line printer and other products in Booths 3118, 3120 and 3122.

Super Smart. Super Simple.

Together for the first time in ADDS New System 70.

and PRINT the day you plug it in. It's all preprogrammed on dual microprocessors. That's smart.

And simple. Because to get System 70 to SEARCH, all an operator has to enter is the word SEARCH. We call it TCL; our Terminal Command Language. You'll call it EASY.

extensions, [illegible] fields or check [illegible] calculations. With System 70 you customize forms yourself, right on the display; without assembly or debugging of complicated programs. It's that simple.

And smart. System 70 is IBM 3780 or teletypewriter compatible. It has single or dual

Datapacer on Show

NEW YORK – Tennecomp Systems, Inc. will show its Digital Equipment Corp. PDP-8- and PDP-11-compatible Datapacer cartridge tape system at Booth 1216.

The Datapacer is said to feature a 3M Co. DC300A data cartridge which has a storage capacity of up to 2.8M bytes on a four-track cartridge.

The read/write speed of the tape system is 30 in./sec; the search speed is 90 in./sec operating bidirectionally, according to the company.

Base prices for single-track and four-track models are $2,980 and $3,490, respectively, and include a software package with load and dump routines, DEC operating system drivers, Tennecomp interpretive language I/O library routines and diagnostics, the company said from 795 Oak Ridge Tnpk., Oak Ridge, Tenn. 37830.

DG to Set Micronova 16-Bit in Motion

Miniworld at NCC

NEW YORK – Conference attendees visiting Booth 1503 can see Data General Corp.'s (DG) first public demonstrations of its high-level Ansi-74 Cobol compiler and the 16-bit microprocessor-based Micronova.

The Cobol compiler will run on an Eclipse C/300 minicomputer, DG noted. It fully supports Infos, DG's data base-oriented file management software.

The Micronova models 8562 and 8563 feature a 16-bit microcomputer with 2K- or 4K-word random-access memory (RAM); additional RAM and programmable read-only memory (Prom) boards expand system capacity to 32K-words, DG said.

A Nova 3 computer which communicates with the Eclipse C/300 in a distributed processing network will also be shown, the company said.

The input from the Nova 3 will be processed on the C/300 and the output transmitted back to the Nova 3 via a Multiprocessor Communication Adapter.

DG is located on Route 9, Southboro, Mass. 01772.

Micro Development Unit to Bow

NEW YORK – The Microkit-8/16, a stand-alone development system for writing, debugging and executing programs on Microkit, Inc.'s 8080 or 6800 microprocessors, will be introduced by the company at Booth 1034.

The system can be ordered with either the 8080 or 6800 CPU. Conversion packages consisting of hardware and software are available so each system can be converted to handle the other CPU, the firm noted.

Features of the Microkit-8/16 include 8K bytes of random-access memory (RAM) expandable to 32K bytes; memory write protect; a 960-character CRT display refreshed from system memory; a 53-key Ascii keyboard with two-key rollover; two audio cassette tape units; and a crystal-controlled programmable real-time clock.

The system also has an interrupt-driven I/O, vectored interrupt, bootstrap loader in programmable read-only memory (Prom) two RS-232C serial interfaces, 1M byte/sec DMA capability and six extra card slots for custom interfaces.

The Microkit-8/16 for either the 8080 or 6800 is priced at $3,850, with conversion packages available from $950. Microkit is at 2180 Colorado Ave., Santa Monica, Calif. 90404.

French Firm Coming With Micro System

NEW YORK – R2E, a French firm, will be participating with its American distributor, Warner & Swasey Co., in displaying the Micral M multiple microcomputer system in Booths 3119 and 3121.

The Micral M consists of up to eight Micral S microcomputers, with each Micral S independent from the other with its own I/O bus, interrupt system and memory. Each unit has its own local memory and shares the common memory so the local and common memory looks like one monolithic central memory for each processor, the firm said.

Programs are run either in the local memory or in the common memory. Memory protect provides a write instruction which references the common memory.

The system has a distributed multiprocessor operating system the firm said was based on sharing the common resources and common real-time task management.

The units can have from 6K to 510K bytes of memory and up to 64 interrupt levels and 512 sublevels, in addition to 64 1M byte/sec I/O channels, the firm added.

Warner & Swasey is at 30300 Solon Industrial Parkway, Solon, Ohio 44139.

Microdata Planning Birth Of Express Mini Family

NEW YORK – Microdata Corp. will be introducing a family of integrated minicomputer systems, a fixed-media "Winchester-type" disk drive and a 3M-type cartridge tape system at Booths 2345 and 3407.

The minicomputer family, Express, features a microprogrammed stack architecture with supporting software that provides multiterminal and multilanguage capabilities, the firm said.

The Express line will be available initally in two versions: one with a cartridge tape storage system and a larger version which will offer cartridge or IBM-compatible tape, Microdata said.

The first system will be priced at $20,000, the latter at $30,000.

The disk drive was designed to replace IBM 2314-type disk drives, low-end Storage Module and Trident-type disks.

The tape cartridge system, meant as an alternative to a reel-to-reel system, records data at 6,400 bit/in., extending cartridge capacity up to 10M bytes, it said.

Microdata is located at 17841 Red Hill Ave., Irvine, Calif. 92714.

[illegible]

What does all this power cost? Practically peanuts. System 70 is under $7,000 in moderate quantities. ADDS System 70.

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See us at the NCC show—Booth no. 1219

COI Showing Mass Storage Units

NEW YORK – Computer Operations, Inc. (COI) will exhibit its direct-access minicomputer mass storage system at Booths 2007 and 2009.

Two of the Linc Tape II systems that will be shown were desgined for Digital Equipment Corp. PDP-11 and Data General Nova minicomputers.

The Linc Tape II is plug-compatible with over 10 minicomputers, COI said. Each system is supplied with the necessary cables, power supplies and interfaces.

Complete operating systems supporting assemblers, Fortran compilers, Basic interpreters, text editors, loaders and file utility routines are available for seven of the minicomputers.

COI is located at 9700B George Palmer Highway, Lanham, Md. 20801.

Start at the top
#3320 at NCC
See our new
HyType
Word Processor
Diablo
Diablo Systems Incorporated
24500 Ind [illegible]

At Data I/O Booths

ROM Emulation System Set for Display

NEW YORK – The Data I/O Corp.'s Read-Only Memory (ROM) Emulation System and the Model VIII portable programmable read-only memory (Prom) programmer will be exhibited by that company at Booths 2835 and 2837.

Data I/O will also show its Model VIII portable Prom programmer.

The Model VIII is an automatic MOS Prom programmer designed to meet the requirements for field service and microprocessor applications, the firm said.

Programming is accomplished using the keyboard, a master ROM or the Data I/O Ram-Pak memory cube as the input data source.

The ROM Emulation System is used to enter Prom program data into the plug-in Ram-Pak, the company said.

The Model VIII is priced at $1,700 and the ROM Emulation System costs $450 from the firm at P.O. Box 308, Issaquah, Wash. 98027.

Analyzer Appearing

NEW YORK – The introduction of a microprocessor analyzer for testing and debugging microprocessor hardware and software will be shown by the Motorola Data Products at Booths 1228, 1230 and 1232.

The MPA-1 reportedly captures 32-word segments of program execution and displays the data on a 9-in. CRT screen, the company said from 455 E. North Ave., Carol Stream, Ill. 60187.

Raymond Has Recorder

NEW YORK – Raymond Engineering, Inc. will show its Model 6409 Mini-Raycorder, a digital tape recorder designed for use with the firm's MI-50 data cassette, at booth 2102.

The recorder has a data capacity of 64K byte/side (unformatted), a packing density of 800 bit/in. and a data transfer rate of 2,400 bit/sec, Raymond said.

It was designed specifically for microprocessors, the firm said, and includes end-of-tape and load-point sensing and write inhibit.

The recorder is priced at $225 in quantities of 100 from Raymond at 217 Smith St., Middletown, Conn. 06457.

Miniworld
at NCC

Varian Bringing Two Plotter Series

NEW YORK – Varian Graphics will show its line of Statos 41 and 42 series of printer/plotters in Booth 3507.

The 41 series features a "Bi-Scan" writing head with a resolution of 100 stylus/in. Each model has a hardware-generated 123-character set and can be operated with either roll or fan-feed paper, the firm said.

The eight models in the 41 line range from $7,700 to $16,500.

The 42 series features 200 stylus/in. resolution and a 125-character set. There are also eight models in this line; prices range from $9,500 to $21,000, the firm said from 611 Hansen Way, Palo Alto, Calif. 94303.

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TANDEM

Tandem Computers Incorporated, 20605 Valley Green Drive, Cupertino, Ca 95014

Variable-Speed Tape Transport Showcased at Triple I Booth

NEW YORK – The Triple 1 Division of the Economy Co. will show its variable-speed tape transport, the Phi-Deck, at Booth 1629.

Phi-Deck features include four-motor control, remote control capabilities, fast start/stop and a rewind speed of less than 30 sec. It can be AC or battery operated.

The transport was designed for microprocessors.

The Phi-Deck is priced at $94.50 with discounts for quantity orders. Triple 1 is at 1901 North Walnut, P.O. Box 25308, Oklahoma City, Oklahoma 73125.

Miniworld at NCC

TI to Demonstrate 990 Micros, Minis

NEW YORK – Booth 2115 will feature a demonstration of Texas Instruments (TI) 990 line microcomputer and minicomputers, which are software-compatible.

The line includes the TMS 9990 microprocessor – the 990/4 microcomputer on a board and the 990/10 minisystem.

In addition the firm will demonstrate members of the Silent 700 series of terminals including the Model 745 and the Model 742 programmable unit.

TI Silent 700 Terminal

Magnetic Tape System Spotted at Booth 1829

NEW YORK – The Model 30-002 dual magnetic microprocessor peripheral system from Micro Communications Corp. features two magnetic tape transports, one for writing and the other for reading.

Shown in Booth 1829, the unit is compatible with Intel microprocessors of Motorola units, the firm said from 80 Bacon St., Waltham, Mass. 02154.

Programmed Power To Feature Monitors

NEW YORK – Power supplies and monitors will be the focal point of Programmed Power's Booths 2819 and 2821.

The Model 3500 automatic power line monitor features its own uninterruptible power supply (UPS) and prints out reports on line conditions and disturbances. It monitors each phase individually or collectively, the firm said.

Programmed Power will also show its System 475, which may be ordered either as a frequency converter or as a UPS. The frequency converter can be retrofitted to UPS, according to the firm, which is a division of Franklin Electric at 141 Jefferson Drive, Menlo Park, Calif. 94025.

Accessories at NCC

Matrix Publishers Seeking Authors, Reviewers, Friends

NEW YORK – Matrix Publishers, Inc., a company devoted exclusively to the publication of engineering and computer science texts and reference books, will be holding forth at Booth 1131.

The firm is currently looking for "authors, reviewers and friends," it said. Those interested can apply at 207 Kenyon Road, Champaign, Ill. 61820.

Standard Memories to Show Line

NEW YORK – Standard Memories, Inc. will exhibit its memory systems for minicomputers at Booths 2032, 2034, 2036 and 2038.

The Buscomm H-11 is compatible with Digital Equipment Corp. PDP-11s; the Pincomm 1 is plug-compatible with the Interdata models 7/16, 7/32, 8/32, 50, 55, 70 and 74; the Pincomm N was designed for the Data General Nova 2; and the Pincomm A is compatible with the General Automation SPC-16 models 40, 45, 60, 65 and 85.

The systems range in price from $1,350 to $5,065, the firm said from 2221 South Anne St., Santa Ana, Calif. 92704.

Qantex to Display Tape Systems

NEW YORK – Qantex will display several of its cartridge tape systems, which it said can offer minicomputers up to 23M bytes of storage with a minimum use of panel space, at Booths 2831 and 2833.

Two of those shown will be the 2400 tape storage system, which can handle up to eight tape drives, and the 2200, which comes with one or two tape drives.

The heart of Qantex's systems is the 600 tape drive, it said. That has a 3M data cartridge with 2.5M bytes, Qantex added.

Qantex is at 200 Terminal Drive, Plainview, N.Y. 11803.

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From Software to Journals

British Coming to Colonies With Variety of Offerings

NEW YORK – Four software houses, two peripheral suppliers, a publisher and an institution will comprise the British participation, taking up a block of booths from 3100 to 3813.

Management Systems and Programming will show three software systems: the Datamanager, a free-standing data dictionary; Testmanager, a harness for testing programs; and Projectmanager, an automated project monitoring system. The company is located at 71 Gloucester Place, London W1H 3PF, England.

Genesys Library

Genesys Ltd. will have an engineer's library of computer programs on hand, which reportedly can be used on a range of programs. The firm can be reached at Pennine House, 2 Lymington St., Loughborough, Lell 1XA.

Northern Software Consultants has a range of integrated multiclient computer software packages designed for accounting and financial control applications for attendees' scrutiny, Northern said from 26 Brown St., Manchester M2 1DN.

Accessories at NCC

Sintrom Electronic's booth will be the place to see the Perifile 6000C, said to be a low cost memory system for digital data recording. The system provides data input and output with storage facilities able to interface to most minicomputers and has software drivers and diagnostics, Sintrom said from 2 Arkwright Road, Reading Berkshire RG2 OLS, England.

The GD-1, a visual display terminal incorporating a microprocessor chip will be shown by Lynwood Scientific Developments, based in England at Caker Stream Road, Mill Lane, Alton, Hants GU34 2QF.

Gershire Journal

Gershire Ltd. will introduce its monthly journal, "Systems International" and its "UK Systems Product Guide Directory" at the show. Gershire is located at 103 Kent Road, Dartford, Kent, England.

Two software packages will be promoted by the National Computing Centre, a non-profit British organization. The Centre is active on the British and International fronts in providing information, advice and training in promoting, in consultation with other computer-oriented organizations, standards in software, it said.

The National Computing Centre address is Oxford Road, Manchester M1 7ED, England.

Booth 1100 Slated As Scene of Display For UPS From Exide

NEW YORK – ESB, Inc.'s Exide Power Systems Division will display a module of its Superguardian uninterruptible power system (UPS) at Booth 1100.

The UPS was designed to protect critical computer systems from disturbances in utility power. It also provides blackout protection through use of battery banks that can take over the power support role without interruption, Exide said.

Price of the system varies according to customer specifications, the firm said from Box 5723, Rising Sun and Adams Avenues, Philadelphia, Pa. 19120.

Broomfield Sets Bow Of Fan-Fold Stacker

NEW YORK – A fan-fold paper stacker will be introduced by Broomfield Industries, Inc. at Booth 1126.

The unit, Accu-Stac, folds fan-fold paper coming out of a printer by utilizing a positive folding motion in synchronization with a set of paper tractors, the company said.

Broomfield Accu-Stac Paper Stacker

The stacking rate is 8,000 line/min at 6 line/in. or 10,000 line/min at 8 line/in., a spokesman said.

After two initial settings on the stacker, no other adjustments are needed, the company claimed.

Broomfield is at Miller Road, Holland Patent, N.Y. 13354.

Liebert Coming to Show With Air-Conditioning Units

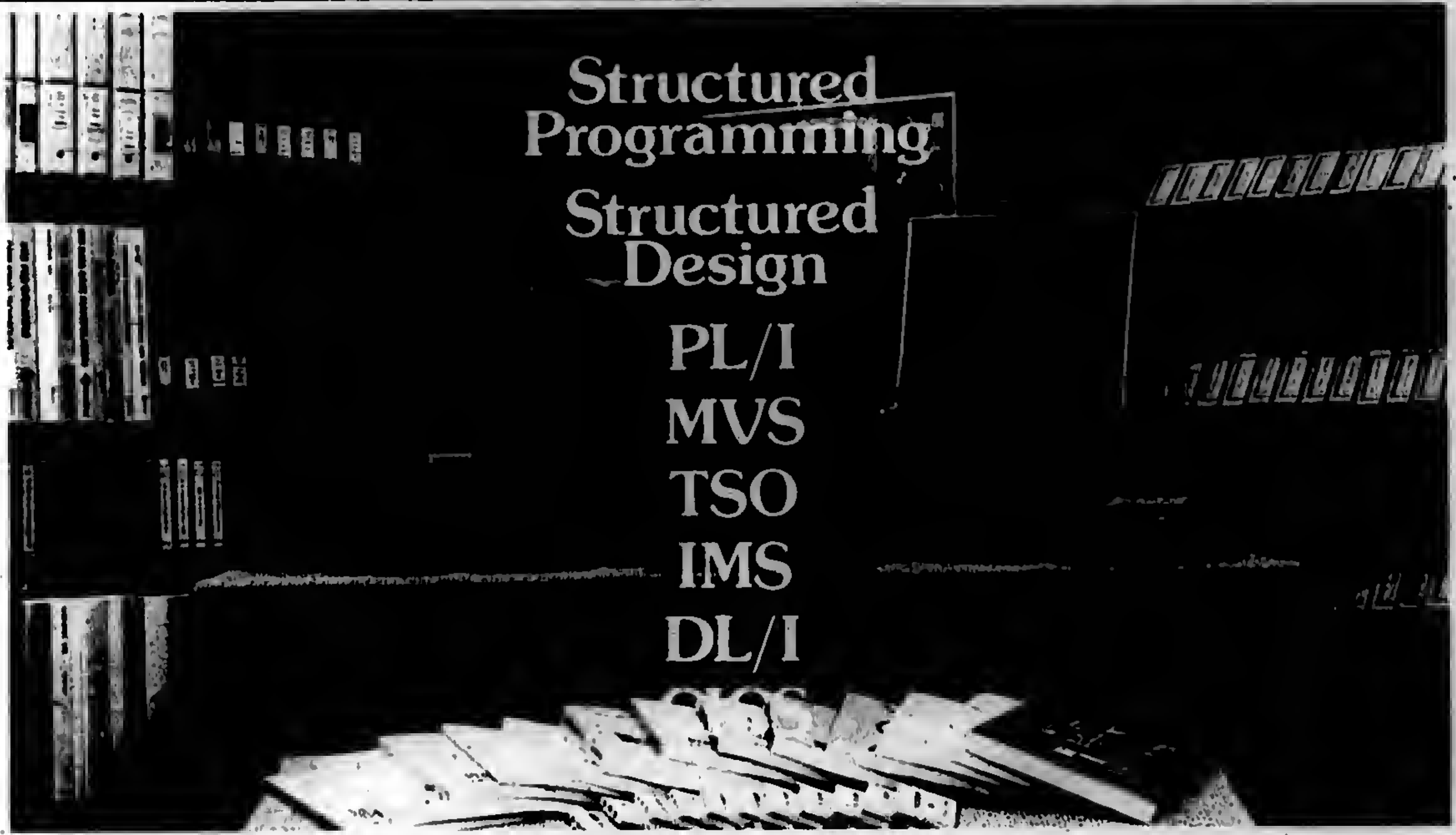
NEW YORK – Liebert Corp. will put its Deluxe System/2 computer room air-conditioning system, Liqui-Tector moisture sensing system and its Autoflush humidifier cleaning system on display at Booths 1345 and 1440.

The company is at 1050 Dearborn Drive, P.O. Box 29186, Columbus, Ohio 43229.

Hushcloth Display Planned

NEW YORK – American Acoustical Products will have its line of Hushcloth sound-suppression materials on display at Booth 1240.

The company is located at 9 Cochituate St., Natick, Mass. 01760.



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Available for viewing at the National Computer Conference, June 6–10 in New York City

Accessories at NCC

Keytronic Sets C Series Debut

NEW YORK – The introduction of the C Series of solid-state keyboards from Keytronic Corp. will be spotlighted at Booths 1706 and 1708.

The series features 82-key keyboards and provides an extended Teletype 33ASR format with a numeric pad which is said to accomplish rapid numeric entry regardless of mode of operation.

Standard features of the Model C 1400 include solid-state keyswitches, two-key rollover, 18 coded function keys and tactile feedback keys, the company said.

Keytronic can be reached at Building 14, Spokane Industrial Park, Spokane, Wash. 99216.

Licon Exhibiting Switch Products

NEW YORK – Licon, a division of Illinois Tool Works, Inc., will have its line of switch products on display at Booths 1127 and 1129.

The company's latest products will be featured, including the Series 54 solid-state keyswitches, a LED keyswitch, a line of push-button switches and a door interlock switch.

Licon is located at 6615 W. Irving Park Road, Chicago, Ill. 60634.

Van San Hopes to Help Attendees Avoid Noise

NEW YORK – Conference attendees might be able to get away from some of the noise on the convention floor by visiting the Van San Corp. exhibit at Booth 1808.

The company will display its Quietizer Model 1111 acoustic cover for the Teletype Corp. 33ASR and Telex 32 ASR which costs $249.50.

Van San is located at 1180 Centre Drive, City of Industry, Calif. 91748.

Magnusonic to Focus On Magnetic Heads

NEW YORK – Magnetic heads will be the mainstay of Magnusonic Devices, Inc.'s (MDI) exhibit at Booth 1420.

Some highlights of MDI's exhibit will be its A2000 series of "flying heads," designed for use with IBM 2314 and equivalent disk drives and operating with disk packs, and the 6250 series of digital magnetic tape heads designed to read and record up to 6,250 bit/in. on 1/2-in. magnetic tape in Ansi-compatible format.

The firm is at 290 Duffy Ave., Hicksville, N.Y. 11801.

Knickerbocker Coming With DP Tool Cases

NEW YORK – Computer servicemen are vital to any DP operation, and they will not be forgotten at NCC. A line of computer servicemen's tool cases will be shown by Knickerbocker Case Corp. at Booth 3517.

Knickerbocker is located at 2950 W. Chicago Ave., Chicago, Ill. 60622.

Reliance Showing UPS To Block Power Flaws

NEW YORK – The 125KW Lorain uninterruptible power system (UPS) will be shown at Booths 2240 and 2242 by Lorain Products Corp.'s Reliance Electric Power Systems Division.

Reliance is at 1122 F St., Lorain, Ohio 44052.

Premix to Show Fiberglass Units

NEW YORK – Computer components made of fiberglass-reinforced plastics will be shown by Premix, Inc. at Booths 1024 and 1026.

Structured Members

The parts – structural members such as bases, housings, keyboards and covers – are molded out of sheet molding and bulk molding compounds.

Premix can be reached through P.O. Box 281, North Kingsville, Ohio 44068.

Datapro Bringing Information

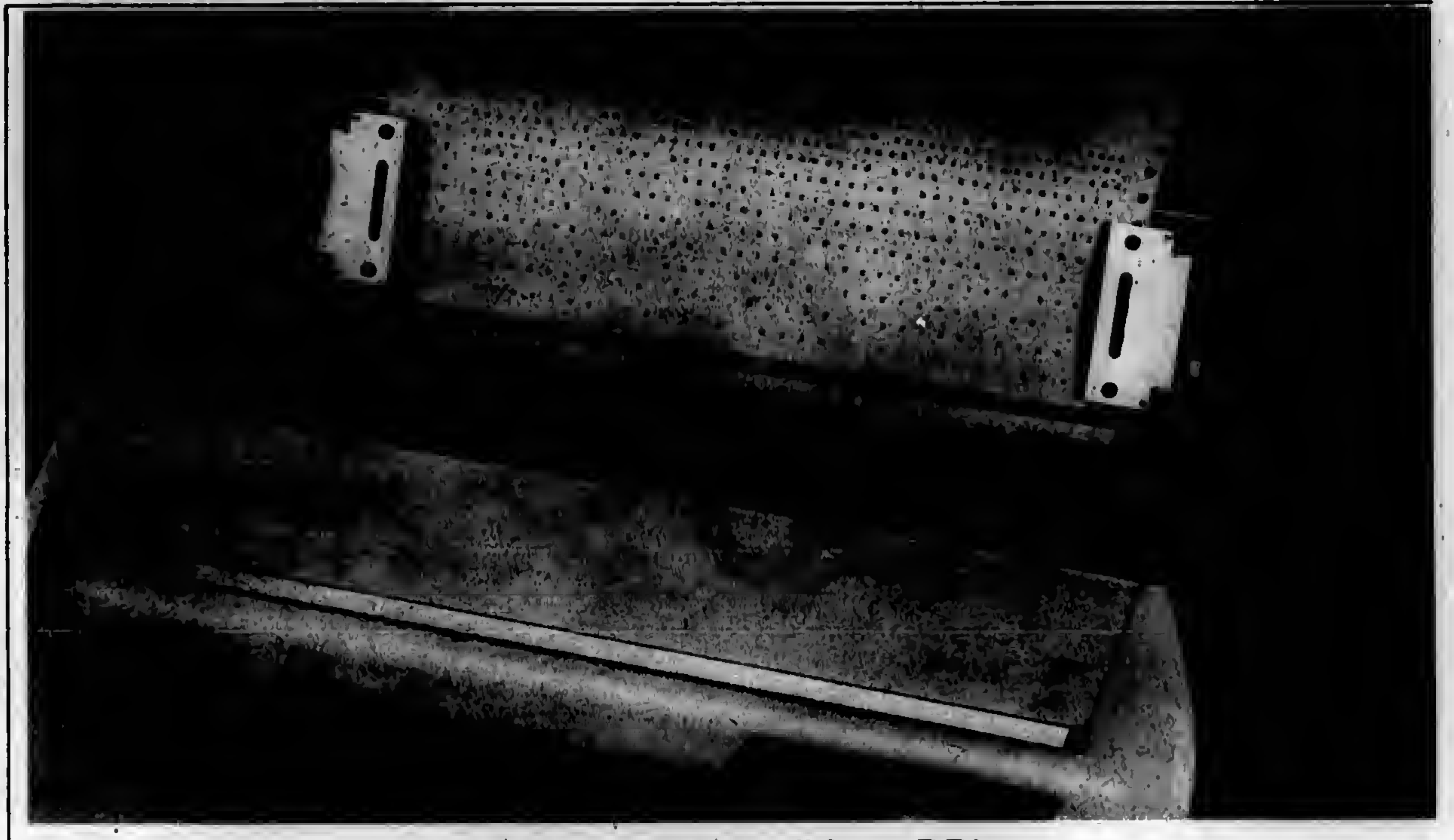
NEW YORK – Datapro Research Corp. will introduce an updated information service, *Datapro Reports on Retail Systems*, at Booths 2754, 2726 and 2728.

The information service will feature detailed product reports on integrated point-of-sale systems, electronic cash registers, electronic funds transfer systems, credit and payment systems, vendors, applications, specialized equipment, software and other retail areas, the firm said.

The service will consist of four components, Datapro said. These include a looseleaf volume of reports and data, bimonthly report supplements, *Retailnews* (a monthly newsletter) and a telephone inquiry service through which subscribers can get immediate problem-solving information.

The annual subscription price for the service is $290; NCC attendees, however, can order the service for $250.

The firm is at 1805 Underwood Blvd., Delran, N.J. 08075.



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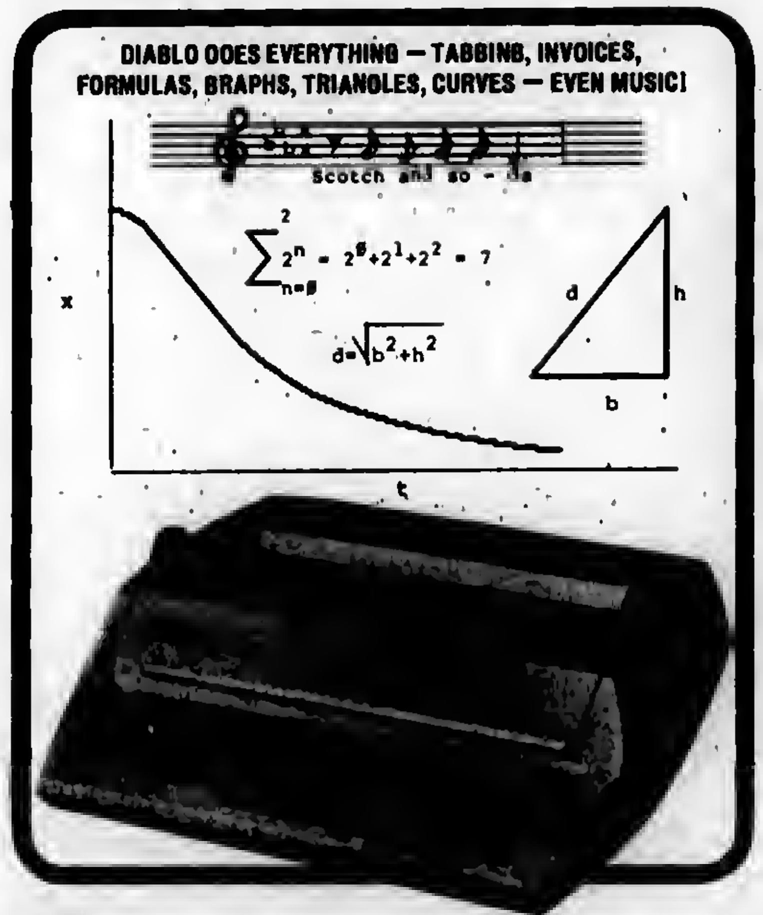
3. THE DDI LEASE PLAN: You pay only $95. monthly on a 3-year lease, with purchase option. Maintenance not included. Two-year leases also available.

Bear in mind, these prices are the full-prices—they include features which may be optional extras on other terminals.

Is the 1620 for you? If it isn't we'll tell you. As one of the nation's largest suppliers of terminals and modems, DDI has no axe to grind... we may suggest a terminal that fits your needs and budget even better than the 1620. For more information on the 1620, write: Data Dimensions, Inc., 51 Weever Street, Greenwich, Conn. 06830. Or better yet, call (203) 661-1700.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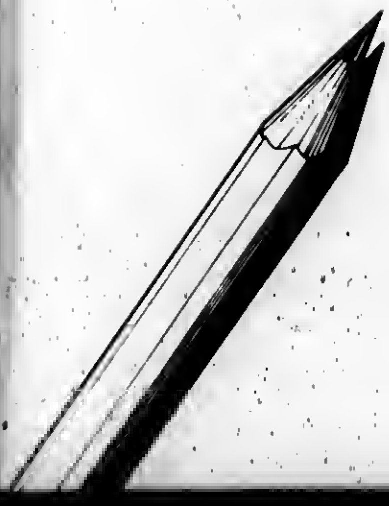

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High-Performance Micros Predicted

CPU Optimization, Storage Surprises Seen for Future

By Molly Upton
Of the CW Staff

BOSTON – The near future will see evolutionary steps for the optimization of large central processors and some real surprises in the storage area, according to panelists at the Electro 76 session on technology assessment here recently.

Several lamented the lack of improvement in man/machine interfaces.

While nearly all paid homage to the microprocessor, most agreed its significance would be its use in a wide range of applications rather than any future technological advances.

However, David House from Intel Corp. said the major impact of micros will be not from their low cost but from their potential high performance.

In the realm of storage, several speakers indicated there are new techniques emerging from laboratories that will change the manner in which computers deal with storage. One panelist said eventually there will be no hierarchy of storage.

Dr. Ugo Gagliardi of Gagliardi System Group told the audience the industry has the wrong perspective when it thinks of data processing as a processor industry. When one looks at the scene, he said, "this is a memory, data industry."

Future happenings in the memory area "could be much more significant" than those from expediting microprocessors," he said.

One surprise lurking in the wings will be a change in archival storage that will come from marrying the technique of home entertainment recording with archival storage, he said.

Video disk recording techniques can store 1 billion bits on a single disk that looks like, but is more rugged than a long-playing phonograph record.

The cost of these can be very low, he said.

With the anticipated market for this, Gagliardi has no doubt that someone will come up with read/write capabilities on this device.

"Think of the consequences on the industry of a billion bits on a $1 or $2 disk," especially regarding small systems, he said.

This could lead to widespread use of data bases for minis. "The opportunity is staggering," he said.

Gagliardi and others focused on the gap between file storage and executable storage. He defined file storage as disk and tape and executable as memory that was accessible.

"The gap is definitely going to be filled; maybe in two years," he said.

More Surprises

Here there is an opportunity for even more surprises, he said, warning the industry that if it focuses solely on plug-compatible replacement of drums and disks it is missing the boat.

"We are mesmerized by the concept of eliminating moving arms," he remarked.

But the real opportunity for the new type of storage, which would come from some of the emerging techniques, will arise from their natural inclination to mix computational ability with storage, such as pattern matching, Gagliardi said.

House suggested some techniques that may have this capability are charge-coupled devices (CCD), bubble and electron beam.

Walter Beam of the research and development office of the assistant secretary

(Continued on Page 62)

IBM, STC, Memorex Drives Rated Equal

By Nancy French
Of the CW Staff

DELRAN, N.J. – Users who left IBM for disk subsystems from Memorex Corp. and Storage Technology Corp. (STC) are just as happy with their systems' overall performance as those who stayed with IBM.

Those who chose products from six other independents were not, according to a Datapro Research Corp. survey published here recently.

Products from STC rated highest in every one of the five categories with the exception of ease of operation.

Users were asked to rate their disk subsystems in five categories: overall performance, ease of operation, hardware reliability, promptness of maintenance service and effectiveness of maintenance service.

To derive weighted averages, a numerical value of 4 was assigned to excellent; 3 to good; 2 to fair and 1 to poor. Each response was given equal weight regardless of the number of spindles represented, Datapro said.

Users of IBM, Memorex and STC rated their disk systems highest with a weighted average score of 3.5 for overall performance. California Computer Products, Inc. (Calcomp) and Telex Computer Products, Inc. were next with 3.3, and Ampex Corp. and Control Data Corp. were third with a 3.2. Itel Corp. was rated fourth with a score of 3.1, and Mohawk Data Sciences Corp. (MDS) trailed the pack with a 2.9.

CDC received the highest rating for ease of operation with a 3.8. Memorex and Telex were next with a 3.7, and Ampex, Calcomp and IBM shared third with a 3.6.

In the category of hardware reliability, STC was first with a 3.5 rating, IBM second with a 3.4, and Memorex third with a 3.3.

Ampex was fourth with a rating of 3.2, and Calcomp, CDC, Itel and Telex tied for last place with a 3.1.

Maintenance was evaluated from two standpoints: promptness of service and effectiveness of service.

In the area of promptness, STC users gave their systems a score of 4, making STC the only vendor to receive a perfect score in any category.

Calcomp and Telex were next with a 3.5, and Memorex was third with a 3.4.

IBM and CDC came in fourth with ratings of 3.3.

As for maintenance effectiveness, STC and Telex won top honors with a score of 3.5. IBM was second with a 3.4.

Calcomp was third with a 3.1, and fourth place went to CDC and Itel which were both given scores of 2.9.

Subsystems Included

The disk subsystems included in the survey were IBM 2311 replacements; the IBM 2314 and its replacements from Ampex, Calcomp, CDC, Memorex and MDS; and the 2314-type double-density drives from Calcomp, CDC and MDS. (IBM never manufactured a double-density 2314-type drive.)

It also included the IBM 3330 and its replacements offered by Calcomp, CDC, Itel, Memorex, STC and Telex and the IBM 3330-II and its replacement from Calcomp, CDC, and Memorex.

It is interesting to note that in the category of overall performance, Ampex products received both the best and the worst scores.

The 312/314 replacement for IBM's 2314 rated the lowest of all with a 2.7, while its 322/324 double-density 2314-type drive received a perfect 4.

Datapro suggested before "rushing out to order replacements" for all his disk drives, the user should consider replacements from three points of view.

First, Datapro suggested the user evaluate the workload and determine conversion costs.

The second consideration should be cost, the third, reliability. Reliability, the report noted, can be judged only after talking with other users.

Intel Has IBM 370/168 Memory

SUNNYVALE, Calif. – A stand-alone add-on memory system for the IBM 370/168 has been announced by Intel Memory Systems here.

It features a microprocessor-powered maintenance panel, modular power supply system and a price tag 30% lower than that of the IBM model, according to the vendor.

The IN-7168 memory system stores from 1M bytes to 8M bytes in a single frame that is connected in parallel with the CPU memory port, Intel said.

When used with the minimum 1M byte of IBM memory a 168, the unit stores up to 7M bytes for a total of 8M bytes, the firm said. A second all-Intel 8M-byte unit can be added for a total capacity of 16M bytes.

Transparent to the CPU in operation, the microprocessor allows the user to identify failing memory parts, whether in the IBM or Intel part of the memory, Intel said.

If a repair is needed, the modular power supply in the unit allows the user to shut down the memory in 1M-byte units so that most of the memory can remain operational while the repair is being made, Intel said.

The unit has the same speeds as the IBM main memory for the 370/168 and the same four-way interleaved operations, Intel said. Cycle times are 320 nsec for full storage, 320 nsec for fetch, and 640 nsec for partial storage.

Service Processor

Intel's maintenance panel provides a memory service processor comparable to that of the SVP in an IBM 370/168 Model 3. It contains an Intel 8080 microcomputer system and is designed not only to expedite maintenance of the Intel memory, but also to identify any failing memory in the 370/168 system. Thus, IBM's system configuration feature can be utilized to keep a maximum amount of storage continuously available to the CPU, Intel said.

Available to the operator are error logs for total memory and a power supply display. These allow the ability to reconfigure the total memory system to prevent errors from causing system crashes and also to avoid potential power supply problems.

The IN 7168 rents for $4,500/mo for a 1M-byte configuration or $32,000/mo for 7M bytes. A 1M-byte unit sells for $145,000, the firm said from 1302 N. Mathilda Ave., Sunnyvale, Calif. 94086.

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Helps Pick Repairman

System Predicts Firm's Service Demand

MINNEAPOLIS, Minn. – Minnesota Gas Co. (Minnegasco) has developed a computer system to predict the demand for service and help pick the right repairman for the job.

By mid-morning, Minnegasco knows approximately how many customers will call that day regardless of the weather. That information helps pinpoint for the customer when the serviceman will arrive.

The system samples customer demand in the morning and afternoon and predicts the total number of service calls expected that day based on the number already received. Approximately 40% of daily volume is received by 10 a.m. and 70% by 2:30 p.m. Minnegasco handles an average of 1,500 calls daily and as many as 4,000/day.

"Since installing the computer-aided dispatching system in 1973, we have increased productivity – service calls per man-day – more than 5%, and 'can't-get-in' reports are down 25%," Gene Nessly, vice-president, said.

"We know when a serviceman will arrive so that customers don't waste time waiting, and the repairman doesn't arrive when no one's home."

When a customer calls for service, a clerk enters the order and schedules a service call via a display unit linked to an IBM 370/135.

Dispatchers using similar devices display work orders and assign them to some 250 servicemen. Emergency calls appear more brightly on the display unit and get top priority.

Meters awaiting testing surround servicemen at Minnegasco. The company uses a computer-aided system for dispatching its 250 servicemen.

Stored in the computer system are orders, skill levels of each serviceman, the equipment he carries in his truck, men per shift and length of time required to handle each type of service. The system combines this information with its forecasting ability to help dispatchers balance the workload.

As servicemen complete tasks and report in, dispatchers assign new jobs. They can use their display units to compare the time requirement of a specific job with a repairman's current workload to determine who should handle the next assignment.

"The system helps put the right man on a specific job," Nessly said. "We have enough men to handle emergencies as well as the routine maintenance and repair calls. This is critical since demand fluctuates. On the first cold day in the fall, for example, demand for checking furnaces skyrockets."

When an order is entered, the system checks to make sure it doesn't duplicate an earlier order. The system also prints reports to help Minnegasco check its ability to solve customer problems. One report lists "call backs" – customers who have requested service more than once for the same problem.

"We get reports which show how long a job should take and compare that information with how long a serviceman spent on it. Not only does this help us in scheduling manpower, it helps identify people who would benefit by more training in servicing equipment. As appliances become more complex, our servicemen need more education."

Minnesota Gas Company is a natural gas distribution utility serving approximately 360,000 customers in Minneapolis, its suburbs and outlying areas. Its service force handled some 404,000 requests from customers last year.

Storage Surprises Seen for Future

(Continued from Page 61)

of the U.S. Air Force took a slightly different approach when he advocated use of data with its own characteristics. He said computer architecture will change to relieve the programmer of having to keep track of registers and other such chores.

This will be accomplished through attaching identifiers to the data, in a manner similar to that used by the APL language, he said.

In this way one can use low cost hardware to simplify the software, he remarked.

Solid-State Intermediary

Jim Thornton, president of Network Systems, said the storage hierarchy in four or five years will consist of central memory, buffer, working storage and archives.

But in 10 years, perhaps solid-state will remove these levels. There should be new storage/staging facilities that will introduce solid-state memory as an intermediary, he said.

In the world of nonmanual archiving, there will be a migration of data in the hierarchy of storage levels until eventually "we'll see a smoothing over of the nature of the data and movement of it."

Eugene Shapiro of IBM categorized the progress in storage as evolutionary because of the economics of the massive installed base.

Within five to 10 years bubble memories will come into place somewhere in the hierarchy, he said, adding the thin-film-head technology is changing the argument about head per track.

But magnetic recording will be around for a while because of the economics and convenience. "If you want low cost, you'll give up time," he said.

Printers in Stone Age

Shapiro said the real need is to match printers to people. Until recently, "printers have been pretty much in the stone age," he said.

Eventually, printers will turn out documents that are useful and machine readable. This will spawn a new area of technology, he said, emphasizing there is a need for new ideas in this area.

Thornton said large CPUs will be around and described various efforts to optimize them reflecting the demands placed upon them by the terminal environment and increased data bases.

When the data base management function is removed from the host machine, then we'll see many innovations to improve the CPU, he said.

One critical problem, he said, is that systems are reducing the bandwidth at terminals at the expense of the bandwidth at the CPU.

Other speakers suggested that in the future the combination of data and logic could serve to solve this problem.

There will be a major tug of war between the standard channel and the intelligent controller attempting to remove the data base management task from the host machine, Thornton said.

Keith Uncapher, director of Information Sciences Institute, remarked the user's appetite for local processing power is growing. By 1980 there will be a demand for local power with three times the capability of the Intel 8080, he said.

Uncapher called on software developers to recognize the need to support the user and make these systems adaptable to users' local needs and idiosyncrasies.

The problem is there has not been nearly enough progress in interfaces for novices, he said.

DPers Chastised

BOSTON – Keith Uncapher, director of the Information Sciences Institute and former president of the American Federation of Information Processing Societies (Afips), chastised DP professionals recently for not doing more work on data protection.

He told an Electro 76 session he hopes industry can face up to and solve the problem in a responsible way.

Otherwise the alternative is to insure and posture ourselves like the medical community, and "we'll face malpractice suits soon," he said.

Switches to On-Line Order Entry System

Bedding Firm Decides Not to Take Errors Lying Down

LOUISVILLE, Ky. – Moving to an on-line order entry system using an in-house computer from a combination keypunch operation that involved a service bureau has paid off handsomely, a home furnishings manufacturer here said.

For Louisville Bedding Co., a large manufacturer of mattress pads, the order entry operation is the first step in a planned, totally integrated system that ultimately should cover the entire cycle from forecasting to shipment.

Started in January, the real-time order entry program has resulted in faster order processing, fewer errors, better customer service and greater internal control of operations, according to Earl M. Tanksley, managent information systems manager.

Under the old system, Louisville Bedding experienced a considerable number of order entry errors plus as much as a 24-hour delay in discovering where an error occurred and then correcting it.

The number of orders "kicked out," according to Tanksley, now ranges from 3% to 4% vs. an average of 20%.

Apart from the benefits in better customer service, Tanksley said he expects the company will be able to achieve savings of more than $500,000 over a five-year period by using its own computer.

The system is being implemented on a Univac 90/30 computer using the Univac Information Management System 90 (IMS/90).

Prior to the on-line system, orders were manually transcribed from the customer's documents to company forms, then sent for keypunching at a service bureau.

Under the in-house system, the orders are entered directiy into the 90/30 by order entry personnel using Uniscope 200 visual display terminals.

Created Master Forms

"Because many of our large customers buy similar goods with each order," Tanksley said, "we've created contract master formats for them which we can call up from disk storage whenever we're ready to enter new orders.

"With the contract master displayed on the CRT, the operator only has to key in the variable information – quantities ordered and requested shipping date – and assign a 6-digit control number for each order."

Prior to accepting the order, the system checks customer credit limits, availability and prices. If there are any problems in filling the order or if incorrect information has been entered, the computer will flag the operator by a blinking light that draws his attention to the problem area of the format.

The information is edited on-line and then transmitted to the computer, Tanksley said.

Still Uses Service Bureau

Now, during the development phase, the orders transmitted from the terminals go into the disk storage files on the 90/30. At the end of each day a magnetic tape is prepared containing all the orders received that day.

This tape is sent to the service bureau, which the following morning updates inventory records and all relevant company files and generates picking lists for the distribution center.

Updated copies of the files on magnetic tape are returned for entry into the inhouse system.

However, as new systems are developed and implemeneted on the 90/30, these applications will be discontinued at the service bureau, Tanksley said.

The decision to acquire an in-house computing capability resulted from an evaluation of Louisville Bedding's operations conducted by Peat, Marwick, Mitchell & Co., management consultants.

"The evaluation was necessary because we realized that our continued high rate of growth was surpassing our ability to capture the vital information we needed to control our business on a timely basis," according to Harold C. Forrester Sr., president and treasurer of Louisville Bedding.

"While our previous DP system was sufficient to carry us through when we were handling a much smaller volume, it was totally inadequate to cope with our present rate of growth.

"Additionally, we felt we could respond to the marketplace much sooner and effectively with our own computer."

As part of Peat, Marwick, Mitchell's recommendation for the firm to engage an experienced systems manager, Tanksley joined the company to survey the company's requirements and recommend proposals to top management.

At the same time, a management committee was formed to review and coordinate the plans to revamp operating procedures.

One of the committee's decisions was to implement entirely new systems rather than try to build on the existing system. Another was to acquire an in-house computer with the capability of meeting the company's growth needs over the long term.

Louisville Bedding's 90/30 system has a main storage capacity of 132,000 bytes as well as extended mass storage on two Univac 8416 disk drives totaling 57.8M bytes.

Other components of the system are two Uniservo 6 magnetic tape subsystems (shortly to be replaced by Uniservo 10s), a visual display unit on the operator's console, card reader and printer.

Currently the system also includes one Univac 1710 keypunch and six Uniscope 200 displays – four in order entry, one for programming and another for file maintenance and inquiry.

Additional Uniscope 200 units are planned for installation in the customer service, production planning, shipping and accounting departments, Tanksley said.

Tanksley believes one of the main benefits of the system will be much finer inventory control than before. A terminal in the distribution center will immediately report to the computer all arrivals of finished goods.

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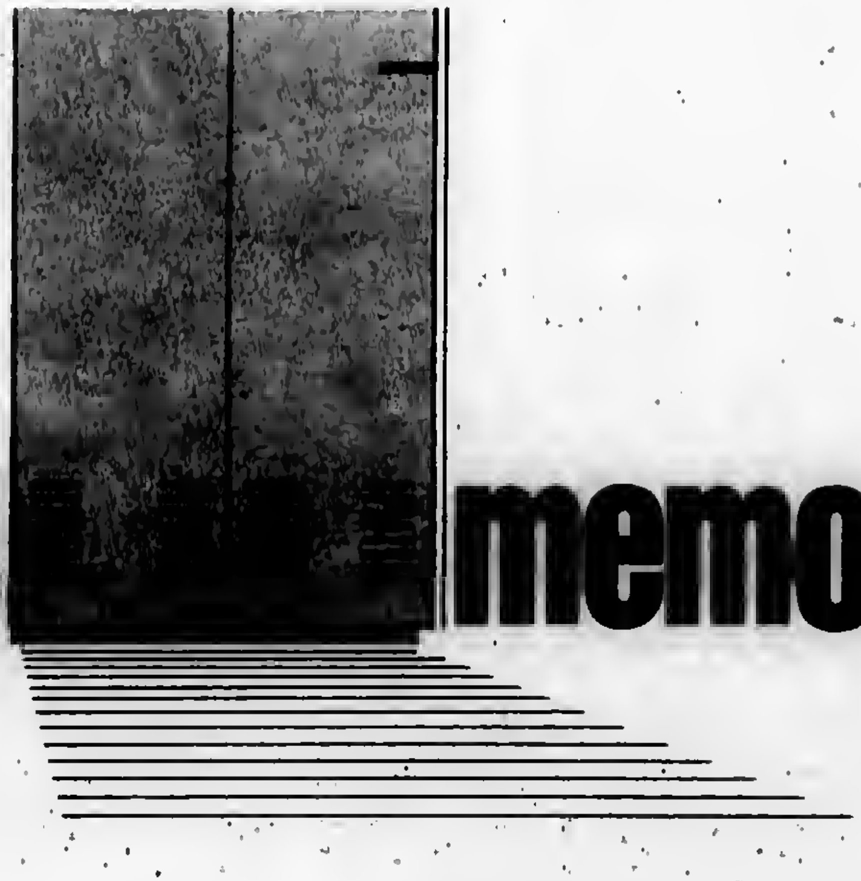

370/158 memory

High-Capacity Disks Speed Throughput, Reduce Costs

By Gary M. Holtwick
Special to Computerworld

Studies have shown that as much as 90% of the volumes in a tape library contain less than 10M bytes of data and that 50% of the tape volumes contain less than 1M byte of data. Using 6,250 bit/in. tape, these data sets (less than 10M bytes) will occupy less than 300 feet of tape on a single volume.

The economics of these data sets remaining on tape are poor. The characteristics of these tape data sets strengthen the merits of tape replacement with high-capacity disk.

Tape replacement suggests moving small tape data sets to on-line high-capacity disk to achieve the following benefits:

- Reduced tape library size.
- Faster throughput.
- Fewer tape mounts.
- Improved reliability.
- More availability.
- Increased computing capacity.
- Lower personnel costs.
- Reduced media costs.

When choosing tape data set candidates for conversion to large-capacity disk, data set activity, capacity and cost of storage should be considered. Only those data sets that will be cost-effective on disk should be converted, therfore keeping on-line storage requirements at a minimum.

There is a great deal of interest today in mass storage systems. In the accompanying article, an alternative to mass storage systems is presented which calls for the use of Storage Technology Corp.'s Model 8800 "superdisk" and 6250 tape units.

The following formula can be used to determine which tape data sets should be converted to disk when considering cost effectiveness:

Data Set Mounts Per Month = DASD Cost (Cost/Megabyte/Mo)
Data Set Size in Megabytes = Tape Cost (Cost/Mount)

For example, consider a 1 by 4 Storage Technology Corp. (STC) 8800 configuration for tape replacement at a cost of $1.95/megabyte/mo and a typical tape mount cost of $1.95. The cost-effective ratio (the right side of the previous formula) using the above cost equals one.

The formula now states that any data set whose mounts per month divided by its size is greater than (or equal to) one will be cost-effective on large-capacity disk..

Once data sets have been selected for migration to disk, storage requirements can be further reduced after reviewing the following operational considerations.

When operating from disk rather than tape, it is beneficial to use Generation Data Groups (GDG) to simulate the classical old master/new master operation tape. A generation data set is one of a collection of successive, historically cataloged data sets known as a Generation Data Group.

The system keeps track of each data set in a generation group through use of the system catalog so that new data sets can be chronologically ordered and old ones easily retrieved.

To create or retrieve a generation data set, the generation data group name is used together with a relative generation number (. . . -2, -1, 0, +1, +2 . . .). This allows access to data sets chronologically using a relative number.

The current data set is relative zero. Using this scheme, +0 represents the current data set (the new master), -1 represents the old master, -2 represents the previous old master, etc. Because data sets older than -1 are normally in existence only for historical or backup purposes and are seldom accessed, STC recommends that only two generations (0 to -1) be kept on-line.

On-line storage requirements of GDG can be considerably reduced by archiving multiple-generation data sets on a single reel of tape. STC's Generation Data Group Migration Program (STCGDG) can be used to migrate -2 or older generations to magnetic tape.

STCGDG will scan designated disk volumes and migrate to tape -2 or older generations which are not specifically protected by utility control statements. Successful migration will subsequently trigger recataloging and scratching the migrated data set from disk. Upon the completion of a disk volume scan, STCGDG will optionally scratch any temporary data sets older than the current date and then provide a formatted listing of the VTOC.

This procedure not only minimizes disk management activities (scratch operations), but also significantly reduces backup requirements and recovery times when used with the following allocations method.

Assignments of data sets onto a specific volume (or group of volumes) may be accomplished by specific device address, generic names, esoteric names or "VOL=REF" parameter in the DD statement.

Controlled by Personnel

By creating catalog entries to be used by the VOL=REF parameter, data set allocation can be controlled by the systems personnel wtih transparency to the user. The spreading of data sets over multiple volumes by nonspecific volume requests can then be avoided by assigning the Private attribute to these disk volumes.

Installation procedures should be set up requiring the use of the VOL=REF=STC.GDG parameter when allocating generation data sets with the cataloged dummy data set STC.GDG pointing to a disk volume (or volumes) on the same physical spindle to be used for GDGs.

The operations personnel can then flip/flop the STC.GDG pointer by recataloging the data set pointer to a different physical disk module on a periodic basis. In the event of a module being unavailable, this would then force even/odd generations to different physical modules and minimize recovery time.

If a disk module becomes unavailable and it becomes unnecessary to run production jobs using data sets contained on that module before the module is again made available, a rerun is necessary using the previous generation.

In all cases the previous generation will be available on another physical module. Thus, a rerun is followed by the production run. Once the down module is made available, no adjustments will be necessary.

Holtwick is a software support engineer at STC.

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Mini Bits

Mini Devices Among Units Reduced in IBM Repricing

ATLANTA – Some of the price reductions on selected IBM equipment announced recently [CW, May 24] affect products from the company's General Systems Division (GSD).

Some examples of IBM repricing include the following:

- The binary synchronous communications adapter for the 3/6 and 3/10 has been reduced from $10,630 to $9,570.
- The Autocall feature on the 3/6 and 3/10, formerly $1,795, now costs $1,620.
- The Expansion Adapter for the IBM 1130 is now priced at $128 instead of $149.
- On the IBM 1800 system, the Analog-Digital input converter costs $3,850; it formerly cot $4,270.

For the System 7, IBM has reduced the line interface from $1,020 to $860, the GSD said from Atlanta, Ga. 30301.

Application Competition Set

WESTBURY, N.Y. – The First Annual Microprocessor Applications Competition was designed to inspire people to "narrow the gap between today's challenges and tomorrow's realities."

A complete entry kit for persons who wish to participate is available from Schweber Electronics Corp., the competition's sponsor.

Some of the competition requirements include a systems concept; block diagram; listing of component parts; program source listing; and a 50-word description of the project itself.

The project should "make the world a better place in which to live," a Schweber spokesman said.

Judges will look for such qualities as the uniqueness of application, practicality of usage and efficiency in program structure, he noted.

Prizes include a $1,000 grand prize and judging will be done by "prominent leaders from the scientific, educational and electronics business communities," he added from Schweber Electronics Corp., Westbury, N.Y. 11590.

HP Cuts Prices on 9640, 9700

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) has reduced the prices of its HP 9640 and HP 9700 mini systems by $1,000 and $2,500 respectively.

The reductions were possible because of less costly 18-pin 4K random-access memories, a spokesman said.

The HP 9640's price is now $15,800 while the HP 9700 costs $34,800, the firm said from 1501 Page Mill Road, Palo Alto, Calif. 94304.

'Pretty Much Operatorless'

Minis Seen Obsoleting DP Departments

By Esther Surden

Of the CW Staff

SAN FRANCISCO – "Minis are no more revolutionary than typewriters were when they were introduced and, since there was no need for a typewriter department, there will be no need for a DP department," Paul D. Ray of R.R. Associates said here recently.

"Minicomputers are pretty much operatorless machines, and that scares some people," Ray continued. With the advent of minicomputers, the need for keypunch personnel and system operators has almost disappeared, he told a Computer Caravan workshop.

"If I were to define a minicomputer, It would be a system that costs between $20,000 and $300,000 for a complete configuration," he said, adding the word "mini" doesn't mean "small in performance.

"The slowest minicomputer ever built is probably faster than the IBM 360/30," Ray said.

The architect who first designed minicomputers took advantage of all the mistakes by the large mainframe manufacturers so the architecture of minicomputers permits "things that are very expensive on other machines," he told the group.

The small systems have the edge when it comes to on-line processing, he added.

"Despite what I say today, I don't want you to get the impression minis are out to replace the big mainframe," he said, because most minis are "not manufactured with the sole reason to run batch."

Certain types of batch processing will always be needed, he explained.

Not for Batch

A bad point is that most minis are 16-bit word machines, and that imposes a limit on the amount of memory that can be plugged in or the number of peripheral devices that can be attached, Ray said, but noted mini makers are finding ways to get around this limitation.

Prices on minicomputer systems will come down in the next year, but not as much as they have in previous years, Ray predicted.

"During the past year, things have stabilized" because the manufacturers have redirected their energy from the CPUs to all the "things that go around it, such as software and I/O."

'An Old Burroughs Trick'

"The next evoluation will take advantage of microcomputers" by "doing an old Burroughs trick" and taking the control capabilities out of the software and putting them in the hardware, Ray said. This will mean the ultimate decentralization of computer functions.

Minis have been held back in software development to a degree, according to Ray. At first the systems were used for process control applications; when they moved away from this, the first two languages that were developed were Fortran and time-shared Basic because the hardware suited these best.

Hardware Changes

Now the manufacturers are realizing the hardware must be changed to efficiently accommodate other languages, he said, noting Data General Corp. introduced the Eclipse to put Cobol and RPG on its hardware.

Some minicomputer makers build languages that only operate on their own machines, but some users are suspicious of this, Ray said.

"Despite what you may hear about an Assembler language, from machine to machine the basic structures are there and you can be as simple as you want or as fancy as you want," Ray told the attendees.

Datum Bases Nucleus Systems On CPU Emulating GA SPC-16

ANAHEIM, Calif. – Datum, Inc. has introduced four configurations called Nucleus Packages which are based on the firm's Enhancer 1, a CPU that emulates the General Automation (GA) SPC-16 minicomputer, according to a spokesman.

Designed to use GA's RTOS, DBOS and data management software, the systems combine the Enhancer with a variety of peripheral controllers in a single enclosure, Datum said.

The user can obtain peripherals from Datum or other OEMs to complete the system, the firm said.

The Enhancer processor is microprogrammable, allowing additional instructions such as decimal arithmetic and string manipulation to be added, the firm said.

Commonly used or complex subroutines can be implemented in the control store; 256 locations are necessary for the emulation of the SPC-16 instruction set, Datum said.

Control store is expandable to 4K words, the spokesman noted, adding special-purpose instructions can be added in firmware.

The systems are capable of expansion to 64K words of core within the basic enclosure, Datum said. Additional peripheral controller options may be added for expanded capability, it noted.

The El/16-RT Nucleus Package was designed for real-time, disk-based applications. The configuration includes the CPU with 32K 16-bit words of memory; a controller for up to four IBM 2315- or 5440-type cartridge disks; and serial I/O for Teletype or CRTs. It costs $13,950, the firm said.

The El/16-DB Nucleus is an expanded version of the RT with a line printer controller, card reader and punch. The printer controller can accommodate printers with speeds of 300- to 1,200 line/min. It costs $16,350, Datum said.

The El/16-D3 includes the Enhancer with 32K words of memory; controllers for fixed or removable disks; line printer; card reader; card punch; and up to four CRTs. Line speeds are program-selectable from 100- to 9,600 bit/sec. The configuration costs $18,350.

The El/16-D4 is an augmented version of the D3 with 48K of core, controllers for additional disk, line printer, card reader, card punch and four CRT lines. The price is $24,750.

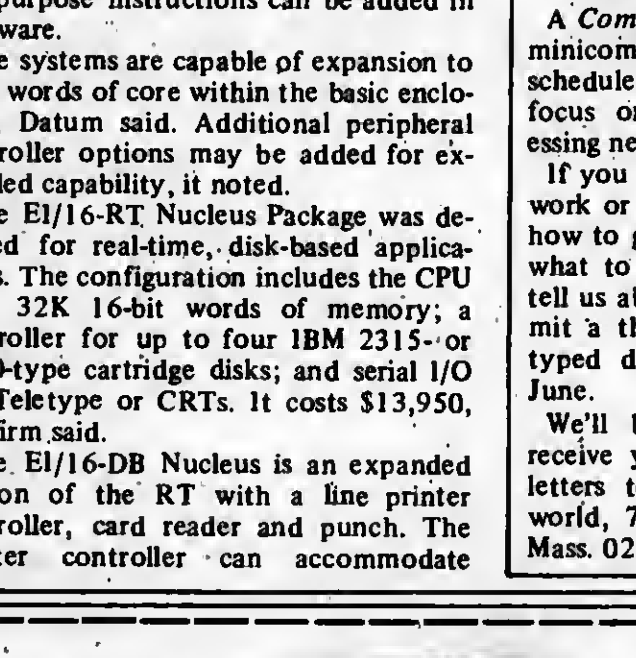
The systems are available within 30 days with no peripherals; with peripherals, the packages take from 60 to 90 days for delivery depending on the availability of the devices, the spokesman said from 1363 S. State College Blvd., Anaheim, Calif. 92806.

CW Wants to Know About Your Site

A *Computerworld* Special Report on minicomputers and small systems scheduled for the Aug. 30 issue will focus on minis in distributed processing networks.

If you have implemented a mini network or have tips for other readers on how to go about doing so – and about what to avoid – write us a letter and tell us about your installation. Or submit a three- or four-page manuscript typed double-spaced by the end of June.

We'll be in touch as soon as we receive your contribution. Send your letters to Esther Surden, Computerworld, 797 Washington St., Newton, Mass. 02160.



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Stores Ancient Greek Texts

Mini Aiding Development of Thesaurus

IRVINE, Calif. – Scholars at the University of California campus here are teaching a minicomputer to write in ancient Greek, bridging 2,800 years of knowledge.

The $1 million project, called Thesaurus Linguae Graecae (TLG), which is said to be one of the largest research efforts ever made in classical studies, is collecting and storing in a data base every word of ancient Greek preserved from antiquity.

The purpose of creating the file of 90 million words – the total body of Greek writing – is to provide classical scholars with a tool for studying how words were used and how their meanings and semantic shadings have changed over the years.

"The finished thesaurus will provide humanities scholars in fields such as history, philosophy, philology and literature with an invaluable reference work designed to aid them in interpreting and understanding the written records of the past," according to project director Dr. Theodore F. Brunner.

The computer facility used here in the TLG project offices includes a Varian 620L minicomputer linked to a Varian Statos 3111 electrostatic printer/plotter. The mini's main function is to work in conjunction with the printer/plotter to produce hard copies of the texts, in Greek, Russian or large-font English.

A teleprinter is also connected to the 16K Varian mini which connects over campus telephone lines, in distributed system fashion, to a Xerox Corp. Sigma 7 central campus computer.

The CPU, which is used to read and store the Greek texts in coded form, also connects to three teleprinters and a display terminal in the TLG project offices.

Building Data Base

All of the ancient Greek literature between the time of Homer, about 850 B.C., up to 600 A.D. will be coded and recorded on magnetic tape.

When a specific word needs to be studied, the system, using TLG-developed programs, will produce listings of each instance of the word's appearance with its appropriate context and word grouping.

The listings will then be sent to cooperating scholars around the world who will provide semantic information about the word as used by a given author, taking into account the historical period and the literary context.

The TLG staff will collect and edit all the received materials; enter them into the data base; and publish, volume by volume, on a first-completed, first-issued basis, the Greek thesaurus.

So far, 80 tape reels containing 18 million words of raw data have been recorded. The first volumes of the thesaurus are expected to be issued before 1980.

The computer processing of the first 20-million words (from Homer through 200 A.D.) represents the project's initial phase. Then, approximately 70 million additional words will be processed, taking the project through the sixth century A.D., which marks the transition from ancient to medieval Greek society.

The documents for entry into the computer data base are selected by the TLG Advisory Board.

Technician's Nightmare

"Processing texts taken from torn and decomposed papyrus fragments is a nightmare to computer technicians," Brunner said, "but it gives us valuable insight into how the language was used in everyday speech."

The catalogued documents are marked to indicate which portions should be entered into the data bank and which shouldn't. Line numbers indicated in the edition are changed to conform to a standard system established by TLG.

Indentation of lines and other instructions are added by TLG staff members so that the page can be recreated as it appeared in the original source. Each source is then double-checked.

Then the Greek texts are keypunched line by line onto cards.

Complicating matters, because the keypunch system is not geared to Greek, the keypunch operators perform a mental translation of the printed Greek text into a special code using English letters and Arabic numerals.

To be sure that no errors are entered into the text at this translation and keypunch stage, separate keypunch operators work independently to create two sets of computer cards for the batch. Each set is then used to create a separate magnetic tape.

The two tapes are compared by a computer programmed to find discrepancies which are then reconciled by comparing the source material with the tapes.

The checked tape is next shipped here and placed on the Sigma 7's CPU magnetic tape drive in the university's DP center. The central system reads the tape and performs a series of verification programs to check the material against orthography rules.

When a violation in the text is found, the verification stops, the text is displayed on the CRT in the TLG offices and the operator provides a solution to the problem before the system continues.

Using this technique of finding errors is actually leading to more accurate texts than was started with, the user said.

The texts contain many type sizes, type faces, Latin letters, italic superscripts and annotations of medieval scholars in foreign languages. To be able to recreate pages with the system means that each variation must be coded to indicate to the system which alphabet set is to be used, Brunner said.

Three Micro-Based Controllers Offer Nova, PDP-11 Users Options

BURLINGTON, Mass. – Xylogic OEM Components Group, Inc. has three microprocessor-controlled cartridge disk drive controllers that offer alternatives to their Digital Equipment Corp. PDP-11 and Data General Corp. (DG) Nova counterparts, the firm said.

The Sector Address Verification feature assures the user that program and master files will not be accidentally overwritten, the firm said. The user can also mix work files and permanent files on the same disk drive by taking advantage of sector-level or write protect, the firm said.

Additional standard features include automatic cyclic redundancy check data verification, multiple sector transfers, parallel seeks and automatic detection and by-pass of defective sectors, the firm said.

A built-in self-test feature verifies all data path and control logic circuitry at full operating speeds with disk units switched off-line, the firm said.

The Phoenix 45 is packaged in a standard system unit for installation in a PDP-11 or expansion box and is media- and software-interchangeable with the DEC RK-11 controller. The Phoenix 35 is interchangeable with the DG 4046, and the Phoenix 40 with the DG 4234, a spokesman said.

The 35 and 40 cost $3,150 while the 45 costs $3,575 from the firm at 42 Third Ave., Burlington, Mass. 01803.

Turnkey System Has DEC Hardware

NEW YORK – Datatab Corp.'s Solution 77 Model 354 is a turnkey minicomputer based on Digital Equipment Corp. hardware, the vendor said.

The system, designed for business applications, performs order entry, inventory control, billing accounts receivable, accounts payable, general ledger and payroll functions, the firm said.

Hardware includes a DEC PDP-11 minicomputer with up to 36K of memory, removable cartridge disk memory with 2.4M characters per disk and up to eight drives available, a choice of one to four terminals, either CRT or hard copy and a 132-col. printer, Datatab said.

The system "converses with the user in English, giving procedural guidance and an explanation of any input errors detected as the information is entered into the system," Datatab said.

A typical Model 354 including all application software would cost $60,000, a spokesman said from the firm at 888 Seventh Ave., New York, N.Y. 10019.

Correction

The user in the story "Switch from IBM 3 Ends Batch Era for Car Dealer" [CW, May 17], had an IBM 3/10. Also the stock orders have 900 to 1,000 line items each, not 9,001 as reported.

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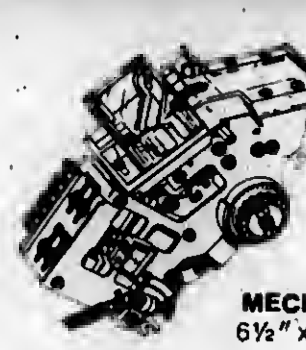

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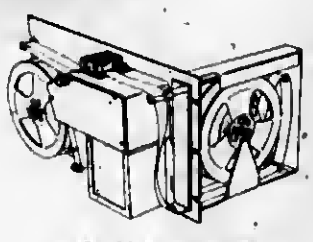

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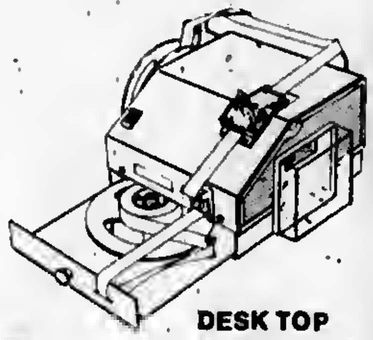

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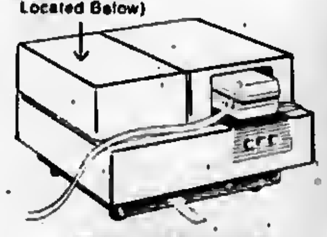

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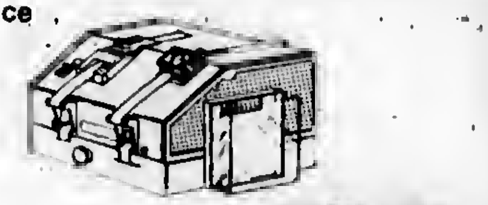

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Pitfalls Often Outweigh Advantages

Caution Advised When Considering Unproven Equipment

By Jon David

Special to Computerworld

Ask any sales representative. He'll tell you. New minicomputer equipment, frequently offered at less cost than not-as-capable but proven alternatives, has been "thoroughly tested and without failure for a zillion hours so far."

Minicomputer Exchange

Or don't ask him. He'll tell you anyway. Just buy his nice new equipment – what could possibly go wrong?

Every time a product is introduced, there are significant potential problem areas. If the equipment is a CPU, it must be interfaced with all available peripheral equipment; support all software operating systems, languages, utilities and other libraries; and this software must support all peripheral equipment.

If the product is a piece of peripheral equipment, it must interface with the CPU and software.

A Simple Choice?

An end user often finds himself with a choice between two pieces of equipment, one offering more power and capacity than the second. They are often at the same price, but if this is not the case, the "better" piece of equipment is normally only a few dollars more and therefore has significantly greater cost/effectiveness.

Even though a user might not need anything beyond the "lesser" product, who knows what changes time may bring to his requirements? Who can fault him for selecting the newer and "better" product?

And although very few applications ever tax the limits of the capabilities of existing minicomputers, manufacturers continue to announce new and more powerful computers and peripheral devices.

Minicomputers have long been able to perform a million or more operations per second; access billions of bits of disk storage; drive line printers at speeds up to thousands of lines per minute; and service dozens, if not hundreds, of concurrent users.

New minicomputers have extended instruction sets, even greater memory capacities, faster memory speeds, different input/output structures and different internal logic.

A new peripheral offers greater capacities; faster operation; different internal logic; and new functional capacities such as memory buffers, intelligence and the like to lessen the computer load.

So a user buys a system containing new and improved equipment.

The system gets delivered. Every component is tested. The software, working in hundreds of other installations, is loaded. The "go" button is pushed, but the system doesn't go. Each component seems to work exactly as it should, but somehow when delivered, the entire package does not work.

Is it the mini? The computer diagnostic runs for hours on end and certifies that the computer is perfect. The peripheral? That, too, tests as working properly. The only thing left is the interface, but exhaustive tests indicate there is no problem in this last area.

Three sets of equipment, each working "properly," yet the combination of the three does not work. Why?

Computer equipment is tested by diagnostic programs. These programs initiate certain equipment functions and test results.

To test results they must, however, make certain assumptions regarding what those results should be. The results for a particular piece of equipment being tested in and of itself are often not the results obtained from that piece of equipment operating in conjunction with other pieces of equipment or operating in a "live" environment. The diagnostic programs therefore frequently do not test the situations that exist when pieces of equipment are delivered and put to use. But, this is not the only problem.

When dealing with new products, field personnel are frequently untrained in diagnosing and treating failures. Even if trained, they certainly cannot be experienced.

The Mini Exchange is intended to be a means for users to present ideas about minicomputer problems and performance. Readers are invited to respond to this commentary or submit manuscripts about significant topics.

Computer equipment has thousands of functional areas, and millions of possible problem paths; it takes quite some time for a service representative to know which areas should be tested and which should be ignored.

Until a piece of equipment has been around for a reasonable amount of time and in a fair number of configurations, new and complex problems can occur on a regular and continuing basis.

Every time a person drives a car he has a chance of becoming a traffic fatality, yet he drives for both business and pleasure. With the possible hardware, software and maintenance problems associated with the installation of new equipment, should a user get it?

Yes and no, but not necessarily in that order: Yes, he should get it if it is the only equipment that can provide the capabilities he must have at a price he can afford. No, he should not get it if he has any other alternative.

Although there is no guarantee that there will be problems with new products, a user is probably more likely to win a lottery than to escape trouble-free, and the troubles can often involve many months of downtime.

The minicomputer field is literally changing on a day-to-day basis. If there was no need or marketplace for new equipment, this would not be the case. As new equipment is delivered to highly sophisticated and technically oriented companies or to end users who can tolerate extensive downtime, initial design problems tend to surface and be rectified, and both hardware and software personnel become more familiar with the equipment.

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and also is president of Systems, RDI.

IBM Adds Storage for 3/8, 3/10

ATLANTA – IBM has an additional disk storage unit for its 3/8 and 3/10, the firm said.

The IBM 5448 disk storage drive adds nearly 10M bytes of fixed-file disk storage to the models.

Added to an existing system with an IBM 5444 disk storage drive, the 9.8M-byte disk drive will provide total capabilities of 14.7M-, 17.15M- or 19.6M bytes, IBM said.

The 5448 has four fixed disks with eight recording surfaces and will be connected as a separate enclosure attached by cable to the CPU, IBM said.

Access times average 126 msec at 1,500 rev/min for an effective data transfer rate of 199 kbyte/sec. The 5448 disk incorporates 400 cylinders and 1,600 tracks.

The 5448 costs $7,845 and rents for $310/mo or $264/mo under the 24-month extended term rental plan.

The disk will be available beginning March 1977, the firm said from the General Systems Division in Atlanta, Ga. 30301.

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For a limited time, Xerox is offering for purchase at reduced prices surplus analog equipment, system interface units (SIUs) and the Xerox system control unit (SCU).

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Order information, including prices and a complete list of available equipment, can be obtained by writing to or calling Bob Purdy, Xerox Corporation, Data Systems Division, 701 S. Aviation Blvd. (A3-47), El Segundo, CA 90245. (213) 679-4511, ext. 1968. Order deadline is July 31, 1976.

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'Little Machine' Helps Test Stresses on 'Big Machines'

MELROSE PARK, Ill. – A minicomputer is aiding the structural testing of earth-moving equipment produced by the International Harvester Pay Line Division here.

The earth-moving equipment must take punishment under all types of field conditions, according to Manfred F. Naujoks, chief engineer. The machines undergo a series of laboratory tests while in the prototype stage which identify structural weaknesses and provide engineers with data to use as criteria for future design work, he said.

Engineers perform tests at the division's Applied Mechanics Laboratory here and at the firm's proving grounds at Antioch, Ill., and Phoenix, Ariz.

Regular procedures include static and fatigue testing of main structural components in the laboratory and dynamic field tests under actual operating conditions.

A Digital Equipment Corp. PDP-11/45 computer is used to store and analyze data taken in the laboratory tests as well as data from the field tests, Naujoks said.

In performing stress analysis tests in the laboratory, Naujoks said, a machine's structure is subjected to a variety of stress cycles under the various load conditions encountered in the field.

Typically, stress is measured by strain gauges with the laboratory loading conditions applied by hydraulic means, he continued.

In the laboratory, strain gauge data is recorded from hundreds of gauges placed on the structural component of the loader. While strain gauges read in micro inches, the computer interface gives the engineer his values in the engineering units most useful to him, Naujoks said.

When the engineers complete the static tests, an operational machine is scheduled for dynamic tests at one of the proving grounds. Selected strain gauge locations from the static tests are used for this field test and measure the stresses on the machine as it is subjected to trials under field conditions.

The gauge signals from the working machine are obtained through radio telemetry. Signals are received, amplified and then recorded on magnetic tape with equipment installed in specially equipped vans.

As the machine moves through its tasks, these signals can be picked up as far as three miles away, Naujoks said.

The field test data is recorded on analog tape and sent to the Melrose Park facility for processing with the computers on site there. The strain gauge data is converted into digital form and analyzed using the Analog PDP-11/40 Hybrid computer system and the PDP-11/45.

The analysis provides histograms, structural life predictions, energy, statistical correlations and vibration analysis.

Kit Allows Users To Program Link For CA LSI Line

IRVINE, Calif. – Computer Automation, Inc. (CA) has a user kit that enables systems designers to program a standard interface to accommodate nonstandard peripheral devices on the firm's minicomputers, a spokesman said.

The standard interface is a general-purpose intelligent cable that contains a small I/O processor called a "Picoprocessor" which can be programmed to interface peripherals to CA's LSI family of minis, the firm said.

The kit enables the user to microcode and assemble programs that customize the standard GP Intelligent Cable with "minimum effort," the firm said.

The kit contains a user-microcode manual, a read-only memory/programmable read-only memory (ROM/Prom) generator program manual, a set of macro definitions on paper tape and a ROM/Prom generator on paper tape.

The complete kit costs $1,000; the Intellignet Cable costs $195 from the firm at 18651 Von Karman, Irvine, Calif. 92664.

Sharp Designs System For General Business

PARAMUS, N.J. – The System PC-2600 from Sharp Electronics Corp. is a desk-top programmable print/display calculator system for general business applications.

The system uses a 19K 16-bit word floppy disk and was designed around a microcomputer, the firm said.

Software for payroll, dealer bookkeeping and other accounting operations is available for the system, Sharp said.

The output printer's speed is 300 line/min, a spokesman added.

The system can perform basic chain and constant calculations; repeat addition/subtraction; and square root plus rounding down, up and off, Sharp said.

The system, including a dual floppy disk and an output typewriter, costs under $10,000, the firm said from 10 Keystone Place, Paramus, N.J. 07652.

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Imsai 8080 Gets Multiprocessor Logic

SAN LEANDRO, Calif. – Imsai 8080 computer users can now obtain multiprocessing capability, according to the vendor, IMS Associates, Inc. (Imsai).

Up to six processors can be connected to a single shared memory block (or several noncontiguous memory blocks) of an Imsai 8080 system, according to the firm. Each processor can operate independently or on a shared basis with one or more I/O peripheral devices, it added.

The processors access the shared memory on a priority basis. When two or more processors access the shared memory simultaneously, they are automatically sequenced according to a preprogrammed priority status, the company said.

The memory allotted each processor is 64K bytes.

The Imsai 8080 chassis has room for several processors, or each processor may be installed in a separete chassis with its own control panel, Imsai said.

Hardware required for the multiprocessor logic includes a bus multiplexing board ($399 assembled, $325 unassembled), a timing and control board ($305 assembled, $225 unassembled), and for each processor, a bus extension board ($65). Delivery is within 30 to 60 days from the firm at 1922 Republic Ave., San Leandro, Calif. 94577.

Micro Products

TI Unveils TMS 4036 Static RAM

DALLAS, Texas – Texas Instruments, Inc. (TI) now has a static random-access memory (RAM) for microprocessors.

Called TMS 4036, the 64- by 8-bit NMOS static RAM is said to suit such byte-oriented CPU systems as the TMS 8080 and TMS 9900.

TMS 4036 is intended to minimize cost/package count for terminal and controller systems requiring 128 words or less of RAM, the vendor said. Like the TMS 8080 and TMS 9900, this static RAM has a common I/Obus which is fully TTL-compatible, it noted.

The device interfaces directly with the TMS 8080, the firm added. Features on the static RAM facilitate memory expansion in a 64-word increment.

TMS 4036 comes in three speed ranges and is priced according to them. Prices in 100-piece quantities are: $5.67 for TMS 4036N (1µs); $6.24 for TMS 4036-1N (650 µs); and $6.80 for TMS 4036-2N (450 nsec access and read or write cycle time).

The static RAM is available from TI at P.O. Box 5012, MS/84, Dallas, Texas 75222.

SC/MP Kit Available from NSC

SANTA CLARA, Calif. –The SC/MP Kit from National Semiconductor Corp, (NSC) is based on the firm's SC/MP microprocessor introduced earlier this year [CW, March 15].

The kit is said to include all the firmware and components a user needs to build a working system for $99.

Included are the SC/MP micro, an 8-bit single-chip CPU housed in a 40-pin ceramic package; 512-byte read-only memory (ROM) preprogrammed to contain "Kitbug," a monitor and debugging program that assists in the development of the user's application programs; and two 1K-bit random-access memories.

Also included are a voltage regulater, an 8-bit data buffer, a timing crystal, a Teletype interface, a 72-pin edge-connector, a 24-pin integrated circuit (IC) socket for mounting the ROM, a 40-pin IC socket for mounting the microprocessor and one 4-in. by 5-in. printed circuit board, the firm said from 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Cramerkit Based on Intel 8080A

NEWTON, Mass. – Cramer Electronics is distributing a wirewrappable, socket packaging board designed by Augat, Inc.

The Cramerkit is based on the Intel Corp. 8080A microcomputer, Cramer said.

The board is color-coded so anyone assembling the kit can compare the colors and numbers on a large schematic drawing to the holes on the boards. The colors correspond to different function areas such as memory, I/O and CPU, a Cramer spokesman said.

The board is available in two versions. The unwrapped board costs $275 and the wrapped board $325 from the firm at 85 Wells Ave., Newton, Mass. 02159.

8-Bit Unit Bows

DALLAS – A complete 8-bit microcomputer on a 4.5-in. by 6.5-in. card is available from Pronetics Corp.

The Model 810 contains a Fairchild F8 microprocessor, 1K bytes of random-access memory (RAM), 1K bytes of firmware and 32 bidirectional I/O ports.

The $179 system is memory expandable with programmable read-only memory, RAM, cassette program loader modules and a terminal interface, from Box 28582, Dallas, Texas 75228.

Hobbyist, Industrial, Educational Users Get Microcomputer

DERBY, Conn. – Mini-Micro Designer from E&L Instruments, Inc. was designed for the educational, industrial and hobbyist user.

The system is based on Intel Corp.'s 8080 microprocessor chip. A memory card featuring 1K of read/write memory is included with the system, E&L said.

The system costs $125 from the firm at 61 First St., Derby, Conn. 06418.

Articles on Micro Design Published as Paperback

ROCHELLE PARK, N.J. – *Microprocessors: New Directions for Designers*, edited by E. Torrero, is a collection of articles from *Electronic Design* magazine on microprocessors.

The 144-page paperback book costs $8.95, a spokesman said from Hayden Book Co., Inc., 50 Essex Street, Rochelle Park, N.J. 07662.

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.

Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

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2. **Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design.** Course *1020* will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Class study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own.
Like Course 1010, this seminar will focus on recent developments in data communications. But Course *1020* will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithims for determining line speeds, number of ports and the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and *10* concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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COMPUTER INDUSTRY

CI Notes

Wema Sees Semi Shipments At $5 Billion This Year

PALO ALTO, Calif. – Shipments of semiconductors in 1976 could reach a record $5 billion, a 24% rise over 1975, according to a "Semiconductor Forecast" published by the Western Electronics Manufacturers Association (Wema).

For the first time, shipments of integrated circuits are expected to exceed shipments of discrete devices, totaling $2.5 billion compared with $2.4 billion respectively, Wema said.

Worldwide semiconductor shipments during 1975 were $4.02 billion, a decline of about 17%. The total is expected to rise to $5.9 billion in 1977 and $6.6 billion in 1978, the report indicated.

DP Makers Improve Energy Use

WASHINGTON, D.C. – The Computer and Business Equipment Manufacturers Association (Cbema) led 31 other groups in improvement of energy efficiency, according to a report from the Office of Energy Policy and Programs, U.S. Department of Commerce.

The reporting Cbema members compiled a 30.5% improvement in the ratio of BTUs per 1,000 sq ft of utilized space.

Data 100 Sells Iomec Lines

MINNEAPOLIS – Data 100 Corp. has sold the assets of its paper tape 'Portaverter' product line and magnetic tape cartridge product line as well as the trade name "Digitronics" to a new Rhode Island company, Comtec Information Systems.

Comtec will continue operations in the plant at Cumberland, R.I. and will employ 60 former Data 100 employees. It is headed by Alfred J. Petteruti, former Data 100 vice-president and chairman of Odec, Inc., which Data 100 acquired in November 1974.

The product lines were produced by Iomec, Inc., which was acquired by Data 100 last September, and are not directly related to Data 100's primary line of terminals, the firm said.

Terms of the sale involving cash and notes were not disclosed.

In addition, Data 100 is choosing its 25,000 sq-ft plant in Westbury, N.Y., obtained in its 1971 acquisition of Compat, Inc. in 1971. The closing will affect 12 employees.

Supershort

Applied Digital Data Systems, Inc. (Adds) has begun shipments of its Consul 520 terminal for which it has received over $1 million in orders since its introduction.

Speedier Recovery Seen

DP '76 Shipments to Near $13 Billion

By Molly Upton
Of the CW Staff

WALTHAM, Mass. – The computer industry should recovery from the recent recession faster than previously expected, according to the "Review & Forecast" issue of *EDP Industry Report* (EDP/IR) published by International Data Corp. (IDC) here.

EDP/IR forecast an increase in total worldwide computer shipments from the U.S. from over $11.5 billion in 1975 to nearly $13 billion in 1976.

The "net add," or shipments minus retirements, will reach its highest percentage of shipments this year since before the 360 to 370 conversions, the report predicted.

As a result, about $123.5 billion worth of U.S-made computers will be installed worldwide by 1980, the report said.

Although EDP/IR confessed U.S. shipments of general-purpose mainframes in the near future will be lower than it forecast previously, it said they will also be less cyclical.

The change in forecast resulted from IBM's apparent strategy of continuing "the staged introduction of nonrevolutionary new equipment," EDP/IR said. This means lower system retirements and a higher than normal percentage of user purchases, it explained.

Two Classifications

IDC classified computers into two categories – general-purpose and dedicated-application. The latter category includes minis and certain larger systems designed primarily for one application such as process control, communications or data entry.

Minicomputers will play an increasingly dominant role in this category; in 1975, mini revenues were 85% of this group's shipments and by 1980 they should be 98%, IDC said.

In 1975 the total installed worldwide base of U.S. shipments was $62.1 billion; it is expected to reach $71.7 billion this year, according to EDP/IR.

Within the U.S., the total base during 1975 was 211,900 systems of $37.8 billion. This was projected as growing to 270,500 systems or $43.1 billion in 1976 and to 680,000 or $70.7 billion in 1980.

International Shipments Good

International shipments of general-purpose computers in 1975 were better than expected, EDP/IR said, adding it expects shipments to grow 10% in 1976 and then 14% to 15% annually for the rest of the decade.

During 1975 the international base was composed of 112,700 units valued at $24.3 million. This base should reach 145,300 units or $28.6 billion in 1976 and climb to 419,000 units or $52.8 billion by 1980, according to EDP/IR.

Worldwide shipments during 1976 should be 104,300 systems, of which 72,800 will be in the U.S., the report said.

In 1980, worldwide shipments should total 225,000 units; 150,400 will be in

(Continued on Page 72)

Mini Mart Growth Recovering; '80 Revenues to Hit $5 Billion

WALTHAM, Mass. – The growth rate of the minicomputer market, which dropped about 50% between 1974 and 1975, should regain nearly half that distance with revenues reaching $1.9 billion in 1976, according to the *EDP Industry Report* (EDP/IR) "Review and Forecast" issue.

Revenues from this sector should approach $5 billion in 1980, the report said.

During 1974 the minicomputer market's growth rate was 62%, but this plummeted to 27% in 1975, when revenues totaled $1.4 billion.

Over 80% of the mini system revenues in 1975 came from the mid-range mini, but by 1980 superminis of the Digital Equipment Corp. PDP-11/70 class will account for 37% of system revenues, EDP/IR said.

Mid-range minis will account for 54% by then, it added.

As minis increase in sophistication, service revenues will account for 20% of all mini revenues in 1980, up from 13% in 1974, according to the report.

With the change in minicomputer applications, by 1980 small business computers will use over half the minis shipped compared with the current quota of one-third.

DEC and Hewlett-Packard Co. (HP) ranked first and second respectively in both minicomputer revenues and units shipped during 1975, EDP/IR said.

But from there the rankings changed according to whether the criteria was revenues or units.

DEC gained 37% of the estimated total $1.35 million in revenues for the worldwide mini market, while HP had 18%. From there the drop was rather sharp to Data General Corp. (DG), 8%; Honeywell,

(Continued on Page 72)

Time-Sharing Firms Go Abroad

By Molly Upton
Of the CW Staff

Several U.S. remote services firms have been busily expanding facilities and networks abroad. For some the sole motivation has been to accommodate large U.S.-based multinational customers.

For many, however, the effort has been made with a dual goal: serving existing U.S.-based multinational customers as well as gaining business from foreign-based firms.

Some firms maintain communications links with points in Europe while others have set up local DP centers in addition to links with the U.S.

Started With Locals

Richard Crandall, president of Comshare, Inc., said his firm originally started out with the approach of installing local data centers staffed by citizens of the respective countries.

Part of the reason for setting up local installations was that the use of computers varied from country to country and, in some cases, there was a vested interest in keeping data within a particular country, he said.

Comshare put a center in Canada In 1969 and now has centers in France, the UK, Japan, Belgium and Holland.

Having local sites has helped Comshare obtain some government business, he said.

Comshare's overseas expansions were motivated by "early customer pressure," Crandall said, and "it seemed clear that major time-sharing companies would have to meet international requirements."

Foreign operations contribute better than one-third of Comshare's total revenues of about $25 million, he said.

Comshare's Belgian and Dutch facilities were opened within the past 15 months, offering links to the UK and U.S. The transatlantic cable link is between London and the U.S.

In France, the local center is run through a licensee, Telesysteme, which offers Comshare Commander I service as well as a link to the UK.

The Japanese center in Tokyo is "difficult for us but we're slogging through it," Crandall said. The center was opened

(Continued on Page 72)

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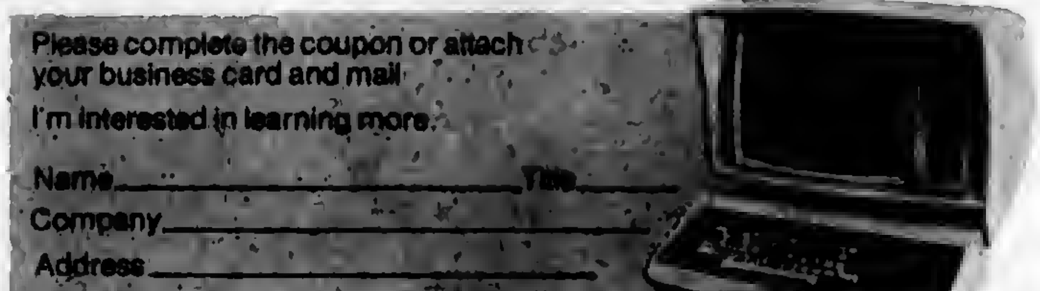

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Remote Services Firms Busy Expanding Nets Abroad

(Continued from Page 71)

under a joint venture with Miroku and has proceeded slowly, he said.

Comshare has increased its ownership to 30% and is looking for additional financing for the Japan operation, he said. The computer operation is doing fine and revenue progress has been made, he added.

Control Data Corp. has 50 Cybernet computer centers in Canada, Mexico, South America, Europe, Australia, South Africa and the Near East, a spokesman said.

There are six centers offering only batch services in Europe; the recently opened Brussels center provides time-sharing capabilities within Europe as well as a link with the CDC center in Rockville, Md.

Brussels has one Cyber 70/73, and plans call for an additional one as well as a couple of IBM machines, he said.

The European centers are interlinked, he said. CDC has been servicing Canada from the U.S., but opened a center there as well.

The business abroad is growing at a faster rate than domestically, the spokesman observed, noting much of the demand is for scientific engineering.

Tymshare May Expand

Tymshare Corp. has network locations in Brussels, The Hague, Lausanne, and overseas affiliates of Cegos-Tymshare and Tymshare-UK in Paris and London, respectively.

Tymshare started its European ventures in 1969 with a center in Paris and added a cable link to the U.S. in late 1972, the spokesman said.

In 1974 it added a second cable and also expanded to London in conjunction with a division of Unilever Services Ltd.

The firm is investigating expanding into other countries, he said.

Although revenues from European operations are not a large portion of Tymshare's overall revenues, they have been growing at a respectable rate, he added.

The operations in both Paris and London have been growing faster than originally projected, he said.

U.S. Packages Popular

Several vendors affirmed that packages developed in the U.S. for various applications are readily transferrable and popular.

APL Services, Inc. initiated a link with Europe less than a year ago in order to provide additional services to a multinational customer, a spokeswoman said. It maintains a satellite link to its data center in Richmond, Va.

On-Line Systems, Inc. offers both local and remote capabilities to its users through a facility in London acquired last fall from Leasco Response UK, a spokesman said.

To the installed Hewlett-Packard gear, On-Line added a Digital Equipment Corp. PDP-11 which is linked via satellite to another PDP-11 in Pittsburgh and then to a Decsystem-10, he said.

Overseas business should account for 25% to 30% of total revenues this year at ADP Network Services Division, according to Ken Draeger, executive vice-president.

ADP has links with Holland, Germany, Italy, Switzerland, Belgium and England as well as four Decsystem-10s in London, which it is integrating into its network.

The firm, formerly Cyphernetics, Inc., has been in Europe about two years and growth has been "very good," Draeger said.

Two months ago it achieved a profitable position with its links.

DP Shipments to Near $13 Billion in '76

(Continued from Page 71)

the U.S. The installed worldwide base should reach nearly 1.1 million systems in 1980, IDC said.

Shipments of general-purpose computers will reach a peak in 1977 at 38,000 units and dwindle to 33,000 by 1980; the dedicated-application sector's shipments, however, will grow from 76,000 in 1976 to 192,000 in 1980, according to the report.

The differences in installed base value between the two types of systems is large, EDP/IR said. The value of the general-purpose base should continue to climb to $100 billion by 1980, while the dedicated-application group's value will reach $23.5 billion by 1980.

Revenues from computer services by 1980 will be just under $8 billion, the report continued.

EDP/IR set service companies revenues at about $3.1 billion this year and forecast a trend toward increased remote access services and transaction processing.

For the first time, this year less than half the services revenues will come from straight batch processing, the report indicated.

Terminals by 1980 will represent a user investment of almost $25 billion, of which about $20 billion will be shipped in the next five years, according to the report.

Mini Market Recovering Growth

(Continued from Page 71)

5%; and General Automation (GA) and Texas Instruments (TI), which tied with 4%.

DEC shipped 32% of the 51,000 estimated units shipped while HP had 12%, followed by Computer Automation with 10%.

DG ranked fourth with 9%, while GA and TI again tied, with 5% each.

Charting the progress between 1974 and 1975 revenues, HP was second only to Control Data Corp., which scored a 100% increase with $30 million.

HP had a 57% increase with revenues estimated at $235 million.

Modular Computer Systems, Inc. (Modcomp) was another star performer compared with its year-ago revenues, chalking up a 46% increase with $38 million in revenues.

Interdata Corp. scored a 30% improvement while Raytheon had 28% and DEC 27% over their year-ago revenues.

However, GA marked an 8% decline in its revenues, which totaled $59 million.

International Data Corp. (IDC), publisher of EDP/IR, defined minis as being general-purpose by design and sold as a tool, not just a solution. A mini is available as a system with operating software and periherals and is offered with OEM discounts; it is generally sold, not leased, IDC said.

A mini has random-access memory of 4K words or more and costs less than $25,000 in base price or is sold in a family with some members which are under $25,000 in base price, according to IDC's definition.

The $4.4 Billion German Computer Market And How To Reach It:

The German computer market is the largest in Europe and the third largest in the world. In 1976, German computer users will spend an estimated $4.4 billion for data processing. Studies show that the 5,000 largest EDP user sites account for 65% of this spending, so like the United States, Germany's computer market is highly concentrated in the larger, professional computer sites.

IDC Deutschland (one of Germany's largest market research and consulting firms) projects that the average growth rate of computer systems sales in Germany will be 14% through 1977; but the growth of certain segments of the market will be much greater. The rate for minicomputers and data communication terminals will be more than 30%. Software and services will experience an annual increase of 20-30%, while data entry equipment is expected to show a sales increase of 25% per year.

Computerwoche, the EDP weekly for the German computer community, reaches the people who control the computers in this $4.4 billion market. With a circulation of 21,000, *Computerworld's* German sister publication, serves German DP professionals with the same editorial excellence that has made *Computerworld* a leading EDP publication in the United States.

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Tab Finds Sales Rising, Leases Down

By Molly Upton

Of the CW Staff

PALO ALTO, Calif. – The purchase/lease ratio is rising at Tab Products Co.'s Data Entry Products Division, according to Dave LeMieux, national marketing director.

However, it is difficult to determine whether this is attributable to a trend in the marketplace or to Tab's recent efforts to stress sales rather than leases, he said.

A year ago, all of the division's business was on a lease basis; now 12% to 15% of orders are sales, he said.

LeMieux suggested one reason might be Tab's Model 501 buffered "data entry microprocessor," which the firm is marketing on a special-order basis.

Third-Party Interest

Another factor contributing to the increase in sales is recent interest by third-party lessors in buffered keypunches, LeMieux said.

Most of these firms restricted purchases of buffered keypunches because they were expensive and the lessors weren't sure how fast customers would convert to other data entry methods, he explained.

Tab sells used Model 400 buffered keypunches at less than the cost of an IBM 029, he said.

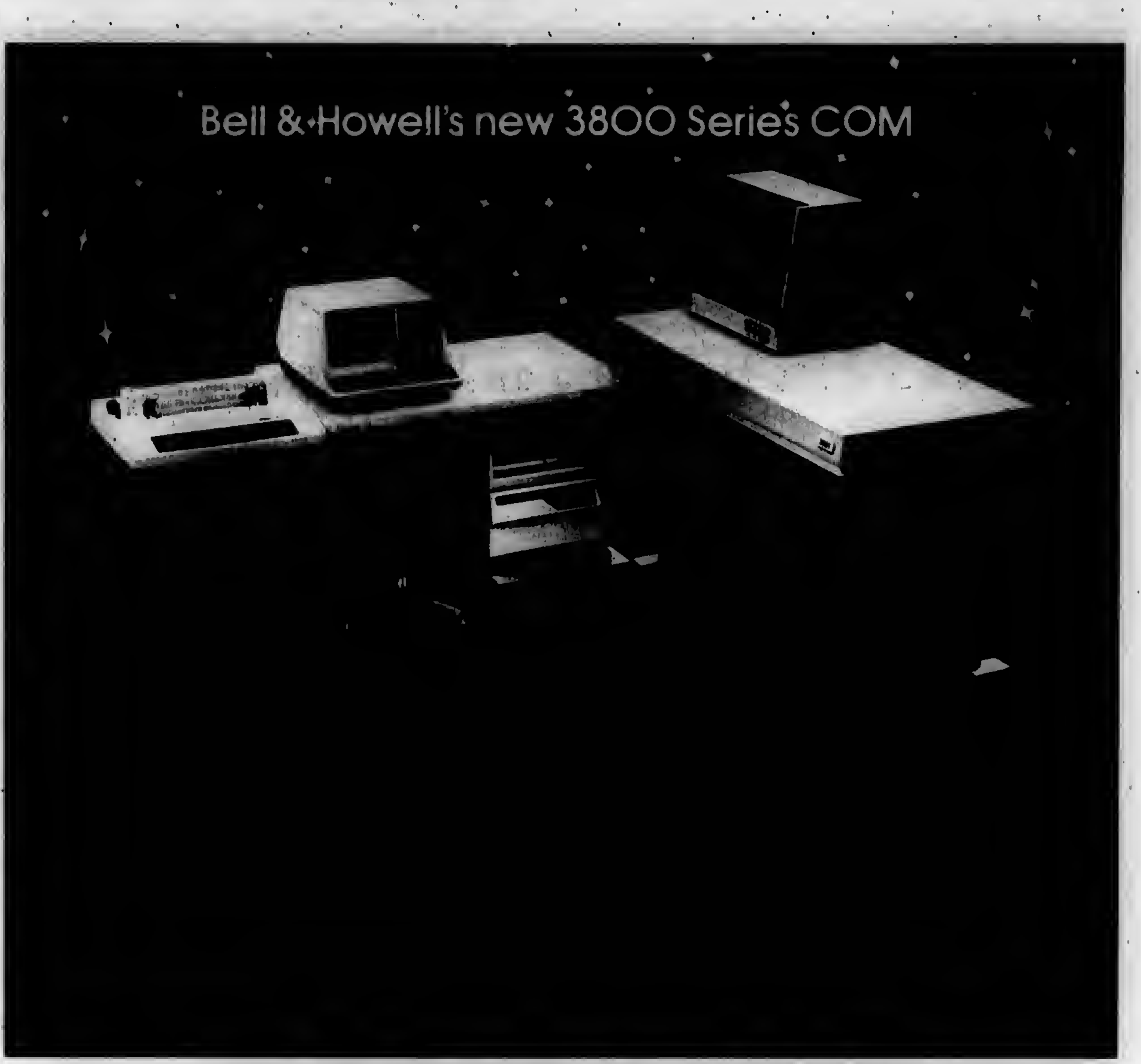
About 25% to 30% of Tab's production is going to Europe, which also is on a sales basis, he added.

In addition to taking Tab into the custom market, the 501 seems to be generating leads for its other products, LeMieux said. Tab has principally marketed to the end user, but has been approaching the OEM with the 501.

Tab is finding OEMs interested, but they seem to prefer to refer their customers to Tab because they worry about servicing the Model 501, LeMieux said.

LeMieux expects the proportion of 501s interfaced to other components to grow.

Tab's keypunches, which it began making about four years ago, now account for one-fifth to one-quarter of the firm's total revenues, he said. The other product lines are media and office equipment such as file cabinets.



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Pertec Division Reports Tape, Disk Business Booming

By Esther Surden
Of the CW Staff

CHATSWORTH, Calif. – Business is booming at Pertec Corp.'s Peripheral Equipment Division here, according to Ralph Gabai, division vice-president of marketing.

The tape business is growing at a rate of 5% to 10% per year projected to 1980 and the disk business is growing even faster – 30% to 40% projected to 1980, Gabai said.

Tape will represent 55% of the division's business while disk will represent 45% during the next year, he added.

Of the disks, 20% of the business is in floppies, he added.

The trend in disks is toward higher capacity and higher performance to meet the needs of "midi" systems, Gabai said.

Since users seem to be migrating to larger, higher performance machines, disks should follow, he remarked.

All products recently introduced seem to be in high demand, Gabai said, allowing the firm to grow and increase its share in the terminal and data entry markets, in which it did not previously compete.

More traditional markets include the large end of the minicomputer line, such as the Interdata 8/32 and Digital Equipment Corp. Decsystem-20, he said.

The trend toward vertical integration by mini makers will peak and then slacken, Gabai predicted.

In the next year, the rate of consumption on the part of the mini makers will drop 15%, he said, but companies like Pertec will survive.

"As big computer companies in the '60s developed a large degree of vertical integration and then realized they couldn't afford to develop their own peripherals, the mini makers will also discover this," he said.

What these manufacturers may save in sales or profits, he continued, they may lose in financing, engineering and overhead.

Compatibility the Theme

The main theme in all of Pertec's offerings is the compatibility of the members of the product line family, according to Donald J. Rutherford, product manager of tape and flexible disk.

All of Pertec's offerings, including hard disks, have fulfilled the compatibility criteria, he said.

The flexible disk filled a bottom area that the 7-in. tape couldn't fill, Rutherford explained, because the 7-in. tape never broke the $1,000 price barrier.

Pertec's tapes are not in the 3M cartridge market and the Philips cassette market, he said, noting the firm has stayed within the Ansi standard or IBM standard market.

"The consumer electronics market is one market that has not been filled by anyone," Rutherford said. "There is still a need for a lower cost type of device to fill this need.

"But the need for greater performance has led us into other products for the higher market end," he added.

The firm has 300 active OEM customers, none of which has greater than 4% of the firm's business, Gabai said.

In disks, the firm also emphasizes the "family of products" approach. The OEM customer can interchange many parts and therefore doesn't have to keep a great number of parts in stock, Ron Dorner, disk product manager, said.

"We try to give our customers more capacity for less money," Dorner said. "You can assume if our line has ranged from 3M- to 24M bytes, it will go to 50M bytes."

One way to do this would be to expand the present technology to its limits. Using existing technology produces less problems and a minimum of maintenance for the OEM's convenience, Dorner said.

Another way to reduce price is through expanding the manufacturing capacity and emphasizing commonality of parts.

"We try to be compatible for our own benefit," Dorner said, "because labor costs increase 5% per year no matter what happens. But if we have commonality, there is less labor needed."

CMC, Now Pertec Unit, Also on Upswing

By a CW Staff Writer

CHATSWORTH, Calif. – CMC, a division of Pertec Corp., is also experiencing an economic upswing, Peter Zinsli of corporate planning said in an interview here recently.

The company, located in Marina Del Rey and formerly known as Computer Machinery Corp., was acquired by Pertec in March.

"Business had been slow for the 18 months prior to October of 1975," Zinsli said, "but it has been steadily increasing lately."

The firm makes turnkey key-to-disk and remote job entry equipment based on minicomputers. Its installed user base is 1,600 systems, and CMC claims 32% of U.S. key-to-disk business, Zinsli said.

The systems are sold to end users only and business is 90% lease, he added.

CMC users are usually IBM 370/135 or larger shops, he continued. The firm competes with the IBM keypunch replacement business of such firms as Inforex, Mohawk Data Sciences, Entrex and Univac, he noted.

Firms Combining Activities

With the acquisition by Pertec, CMC and Pertec are combining developmental and marketing activities, Zinsli said.

The primary thrust in product development this year has been in making a usable sophisticated machine from the standpoint of error detection and reliability, he said. About half of the development time is spent testing, he added.

Trends for the future include rapidly changing communications software, Zinsli said. "There is an increased use of communications in these systems," he continued, that includes the eventual conversion of everything to IBM's Synchronous Data Link Control protocol.

This has been happening more slowly than predicted, he added.

Prices in the key-to-disk arena should not increase in the next several months, Zinsli predicted, but more capabilities may be added to the products with prices kept stable.

Users tend to move to key-to-disk systems in an effort to reduce costs and improve capabilities. The primary concern of the user is reliability, he said.

"With our systems, over 99% of the time the user wants to use them they are available for use," Zinsli claimed.

Users also want a machine to increase their control over entry and the quality of output; they need a system that gives the data with "batched integrity, that is that all of it is there, is verified and it doesn't get transferred more than once," he said.

In addition, users want a system that can be put to use without programming, he explained, noting firms generally don't have programmers to spare for the data entry applications. CMC provides both hardware and software, he added.

The CMC system does things in "a very structured way so it can be used immediately. It takes significantly more sophistication to make it simpler," Zinsli said.

Service is handled by 300 customer service representatives, he said.

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Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg., Jackson, MS 39202, up until 2:00 p.m. 6-14-76 for the following data processing equipment:

Request for Proposal No. 247 for the purchase of a payroll system capable of performing in a multi-agency environment on an IBM 370/155 operating under OS/MVT.

Request for Proposal No. 248 for the purchase of a personnel management system capable of performing in a multi-agency state government environment on an IBM 370/155 operating under OS/MVT.

Request for Proposal No. 249 for the lease or purchase of a small scale disk file oriented computer system with COBOL language capability.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

DP-Generated Guide On Option Trades Set

LOS ANGELES – Weekly computer-generated data on option trades will be available to the small investor for $98/year, according to the institutional brokerage firm of William O'Neil & Co.

The *Stock Option Guide* will contain graphs displaying 40 factors about each stock underlying a listed option and an 11-factor data box about each option itself, the firm said from 10960 Wilshire Blvd., Los Angeles, Calif. 90024.

Expansions

Univac has expanded its marketing and service office in the Woodbridge Center Office Building at Katella Ave. and State College Blvd. in Anaheim, Calif.

Applied Devices Corp. will move its manufacturing operations and associated production engineering and supervision operations to a 105,000 sq-ft plant in Orlando, Fla.

American Datacenters, Inc. has moved to larger facilities at 15302 Bolsa Chica Road, Huntington Beach, Calif.

Hewlett-Packard Co. plans to expand its Colorado operations to include a research laboratory and manufacturing plant in the Fort Collins area.

Centronics Data Computer (Canada) Ltd. has opened a field and depot service operation in Mississauga, Toronto, Ont.

Vydec, Inc. plans to move its corporate headquarters and manufacturing operations to a 77,500 sq-ft building at Suburban Mall, Vreeland Road, Florham Park, N.J.

Interactive Data Corp. has opened an office in the Bond Court Building, 1300 East 9th St., Cleveland, Ohio.

Data General Corp. has purchased a 105,000-sq-ft building and 50 acres of land in Portsmouth, N.H., and plans to establish metal fabrications there by mid-summer.

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Distributor of Terminals Using 'Sears Approach' Sees '76 Best Year Yet

By Molly Upton

Of the CW Staff

SAN FRANCISCO – International Computer Equipment, Inc. (ICE) expects its best year ever in 1976, according to President Peter M. Barzo.

The firm, founded in 1970 on $2,500, expects to report revenues of $8 million to $9 million this year, he said. In 1975 the firm's revenues reached $5 million.

ICE has been profitable since a year after it was founded on the idea of emulating the "Sears' approach" to distributing a line of terminal gear, Barzo said.

Taking the department store's approach, The firm stocks terminals and printers from seven vendors: Digital Equipment Corp., Interdata, Inc., Texas Instruments, Inc., Applied Digital Data Systems, Inc., Lear Siegler, Inc., Datapoint Corp. and Tally Corp.

ICE buys on the vendors' maximum discount schedule and therefore can offer the units to users at a lower cost than some of the vendors can, he said.

Between 80% to 90% of ICE's business is with Fortune 500 companies, Barzo noted. These firms procure terminals through ICE because it offers counseling on which terminal fulfills their needs.

Dealing with a single source for various terminal needs represents a time savings for customers' buyers, he observed.

In addition, ICE offers quick delivery of terminals because of large inventories, he said.

Over half the firm of about 50 persons is comprised of service personnel.

ICE has about 7,000 terminals installed, he said, and maintains most of them. "Service is pretty much a numbers game," he observed, adding the service sector is approaching profitability in its own right.

ICE also procures, when possible, national service contracts with the vendors. It is also investigating having a third-party service organization handle units in remote locations, Barzo said.

The firm has an exchange program in which a user can ship a terminal back to ICE and obtain a new one by air freight, he said.

Mainteins Big Inventory

Contributing to ICE's ability to quote fast delivery to customers is its inventory, which ran between $700,000 and $800,000 last year, Barzo said.

This year he expects inventory to be over $1 million. "It's a cost, but it's worth it," he said.

The maximum delivery time the firm quotes is 30 days, he added. "This is very important to the customer and gives us a competitive edge," he said.

The firm is working on getting a closer view of its inventory forecasting, switching a management information system from a Datapoint system to a DEC PDP-11.

Barzo said he hopes to have daily order entry on-line by June. As the system matches forecasts of sales with deliveries, it can schedule vendors to drop shipments at certain points, he said.

ICE's principal warehouse is in Los Angeles, but the firm also stocks equipment in New York and Chicago, where it has offices.

Careful to Show Profit

When the firm was founded, it envisioned someday either going public or being acquired, so it has been careful to show a profit each year and to have its books audited by a large certified public accounting firm, Barzo said.

Citing ICE's assets, Barzo said the firm has national marketing and service organizations and is a leasing company with a large portfolio.

Part of its business plan was that there would be a good market for used equipment, and that prophecy is coming true, he said. Also, it forecast shortages of parts and deliveries.

The amortized equipment that it has out on lease will contribute to profitability this year, he said. ICE owns about 500 terminals outright and will own 1,500 to 2,000 by the end of the year.

ICE puts the older ones out on short-term lease, he said, and handles the lease paper on some of its leases to large firms; the rest is through a third-party lessor, with the equipment returning to ICE at the completion of the long-term lease.

Signetics Makes Gift To New York Institute

SUNNYVALE, Calif. – Signetics Corp. has donated over $250,000 worth of CMOS integrated circuit technology to the Polytechnic Institute of New York.

The gifts included mask sets, wafers, devices and fabrication manuals for Signetrics' 4000 series logic circuitry, which the company produced until last December.

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Suite 1109
Stemmons Tower West
Dallas, Texas 75207
DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202
FLORIDA
Data Sciences Personnel, Inc.
Suite 205
15490 N.W. 7th Avenue
Miami, Florida 33169
HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105
LOS ANGELES
TeCS, Inc.
3440 Wilshire Boulevard
Suite 1007
Los Angeles, California 90010
MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1716
Minneapolis, Minnesota 55402
NEW YORK
Botal Associates, Inc.
405 Lexington Avenue
New York, New York 10017
PITTSBURGH
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106 Lawyers Building
428 Forbes Avenue
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2530 James Street
Syracuse, New York 13206
TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2626 East 21st Street
Tulsa, Oklahoma 74114
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NCR Century small installation in manufacturing company in Western Mass. Require knowledge NEAT 3, operating software and 3 years experience, including accountingand manufacturing applications. Salary range to $15,000-depending on experience. Send resume in confidence to:

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Qualified candidates must have several years experience with IBM S/360 or S/370 utilizing DOS or OS, ALC (including self-relocating and re-entrant procedures), multi-taskings, data base design and implementation (demonstratable knowledge of queuing techniques and indexed ad direct access file structures), teleprocessing (BTAM) and online VDT transaction processing. Experience with text processing on S/360 or S/370 particularly in a newspaper, and mini computers attached to S/360 is desirable.

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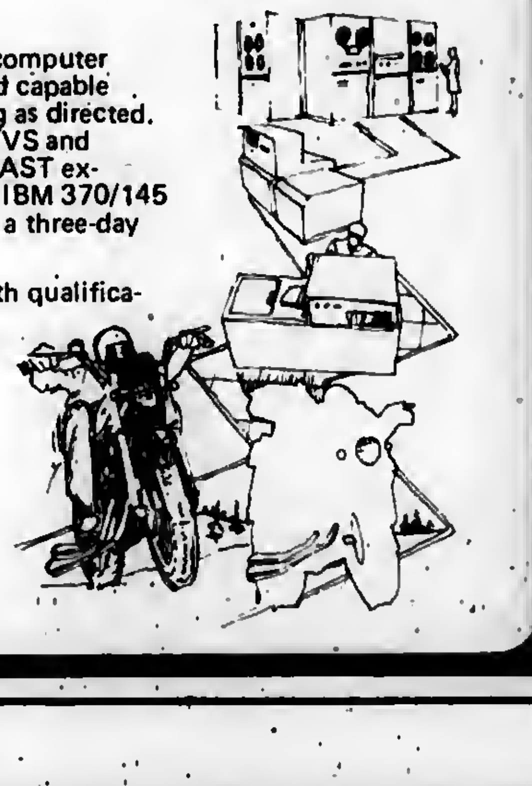
  4 years programmer analyst experience with applications experience in manufacturing, distribution, and financial systems, using IBM 370 computer equipment with knowledge of ANS COBOL, DOS/VS or OS/VSI, DOS/VS JCL, POWER/VS JECL, VSAM, LIBRARIAN, and DL/I or IMS. CICS experience desired but not required. Degreed candidates preferred but not restricted. Good writing ability required.
- **SENIOR PROGRAMMERS**
  3 years programming experience, using IBM 370 computer equipment with knowledge of ANS COBOL, DOS/VS, DOS/VS JCL, POWER/VS JECL, VSAM, and LIBRARIAN. DL/I or IMS candidates will be given preference.
- **JOB SETUP COORDINATOR**
  1-2 years experience in assembling of data files, processing control instructions, and run instructions for processing of jobs in accordance to daily and shift work schedules. Knowledge of tape library and data control functions with complete knowledge of DOS/VS JCL and POWER/VS JECL mandatory.
- **COMPUTER OPERATOR**
  2 years experience operating IBM 370 computer equipment. Candidate must be alert and capable of recognizing problems and responding as directed. Must be thoroughly familiar with DOS/VS and JCL, POWER/VS JCL, and DITTO. TFAST experience desirable. Current hardware is IBM 370/145 with 3330's. Person selected will work a three-day week (twelve-hour shift).



If you are a growth oriented individual with qualifications to satisfy any of our new positions and enjoy working with other professionals in a dynamic, people-oriented company, forward your resume and salary history to:

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East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).

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If your field is computing—Tom Ahern's computer background can help you in your career advancement. Prior to joining Source Edp, Tom was a Senior Consultant with Ernst & Ernst. He also served as a Senior Systems Analyst with Control Data Corporation. He gained his initial exposure as a Naval Officer in Washington in a variety of computer positions which included the supervision of a systems development team in the Pentagon. He holds a B.A. degree from Johns Hopkins University.

If your field is computing—get to know Tom Ahern. Whether you're interested in a position change right now or just want to discuss your career objectives in general, call or write Tom Ahern this week in confidence—he's the person each computer professional should know.

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We are looking for degreed Programmers and Analysts in these areas:

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To qualify you must have experience in large scale communications and data based, OS/VS systems. Languages include Cobol and PL/1 on IBM 370 equipment.

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For further information send resume in confidence to J.F. SWARBRICK or CALL COLLECT: J.P. MARLOW

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Must possess a good working knowledge of financial applications, with 1-2 years experience in systems design.

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The individual we seek must have a minimum of 3 years ANS COBOL programming experience with at least 1 year in an OS environment. Specific assignments will be in the areas of marketing and sales applications with emphasis on the installation of a nationwide Order Entry System. BA/BS Degree or equivalent experience desirable.

We sincerely invite all candidates whose experience and enthusiasm meet our requirements to forward a resume in strictest confidence to:

Mr. A. James Fantauzzo
Supervisor of Employment
Itek Graphic Products
1001 Jefferson Road
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To design, program and document software systems for use on our equipment. Should have 3-5 years telecommunications programming experience and be familiar with communications software and assembler level programming.

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Will be responsible for material scheduling, reporting, follow-up and preparation of bill of material pertaining to manufactured hardware. Must be able to work from engineering drawings, familiar with scheduling techniques such as Gant, PERT, Milestone and Line of Balance. Should have three to five years experience.

Send resume including
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Mr. Don Whynott, Manager of Recruiting and Employment, Datapoint Corporation, 9735 Datapoint Drive, San Antonio, Texas 78284

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Systems/Analyst Programmer

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Computer System & Software Engineers

You can get ahead faster with us than with anybody else.

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We currently have openings within our Home Office Software Support group for individuals who are performance oriented, hands-on doers seeking challenging career and professional growth. Successful applicants will have a solid background in systems and applications programming. They will also have demonstrated problem solving and communications skills in one of the following areas:

- Communications and Networks — You should have a field support/systems programming background in computer based communications/networks products for small, medium, and/or large scale systems.
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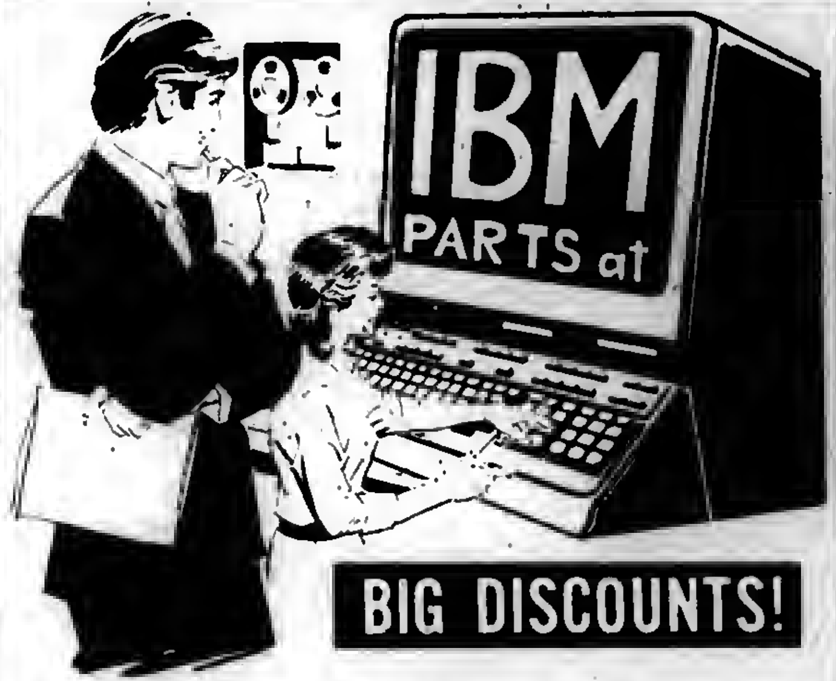

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HP Net Slips as Revenues Rise in Half-Year

PALO ALTO, Calif. – Hewlett-Packard Co.'s (HP) second-quarter earnings were off 1% from those of a year ago and its six-month earnings dropped 8% while revenues rose 13% and 12% respectively.

During the second quarter ended April 30, earnings totaled $23.8 million or 86 cents a share compared with nearly $24 million in the same period last year.

Revenues for the second quarter reached $279.8 million compared with $248.4 million in the same 1975 quarter.

For the six months, earnings were $38.8 million or $1.40 a share compared with nearly $42.4 million or $1.54 a share during the year-ago period.

Half-year revenues rose to $515.4 million compared with $460.4 million a year ago.

Incoming orders during the second quarter totaled $271.5 million, an 8% gain over the $250.4 million booked in the corresponding 1975 period, according to President William R. Hewlett.

For the six months, orders amounted to $550.7 million, up 12% from a year ago, he added.

"It is encouraging to note that our sales and earnings increased substantially from the first quarter of 1976 to the second," Hewlett said.

"Second-quarter orders of $271.5 million were down 3% from the record level of $279.2 million reported in the first quarter, due almost entirely to weakness in the international area," he observed.

"International orders amounted to $131.2 million, down 11% from the first quarter. Domestic orders rose 6%, however, to $140.3 million.

"For the first half of the year, international orders totaled $278 million, a gain of 11% over the first half of 1975. Domestic orders were up 14% to $272.7 million," Hewlett said.

REI Shows Improved Six-Month Results

DALLAS – Recognition Equipment, Inc. (REI) turned in higher earnings on lower revenues in the second quarter, but both earnings and revenues improved in the six months ended April 30.

During the three months, earnings rose to $1.5 million or 25 cents a share compared with $694,000 or 12 cents a share in the same period last year.

The firm said the 1976 period figures included a $700,000 provision for costs to be incurred from a field retrofit program on certain equipment.

Second-quarter revenues declined to $16.7 million compared with $18.7 million in the same period last year, which included $6.9 million from the purchase value of equipment on which REI recorded essentially no profit, the firm said.

For the six months, revenues rose to $33.3 million compared with $29 million a year ago. The figures included revenues from noncancelable long-term leases treated as sales of about $6 million and $3.3 million respectively.

Half-year earnings rose to nearly $3 million or 51 cents a share, including a $1.1 million tax credit, compared with earnings of $1.3 million or 24 cents a share in the same 1975 period, when there was a $741,000 tax credit.

At April 30, the backlog of firm orders, excluding development contracts, for both lease and purchase of equipment was $39.8 million in purchase value, up from the $38.5 million reported a year ago.

Wyly Cites Datran Start-Up Costs In $5.2 Million First-Quarter Loss

DALLAS – Wyly Corp.'s first-quarter loss increased to $5.2 million from a restated $2.6 million a year ago.

The company's cash needs, which continue to be substantial and pressing, were significantly affected by the 1976 first-quarter loss, according to Sam Wyly, the company's chairman.

The first-quarter figure included a $4.4 million start-up loss from its Data Transmission Co. (Datran) unit as well as a pretax contribution of $682,000 from University Computing Co.

The firm managed to reduce debt interest expenses to $900,000 compared with $2 million in the same period last year.

For the three months ended March 31, revenues rose to nearly $16 million compared with almost $15.7 million in the same period last year.

A $711,000 contribution from discontinued operations helped cut losses in the 1975 period, the firm said.

The 1975 results were restated to reflect in discontinued operations the sale of Wyly's energy services operations as of June 1975; the sale of insurance operations in March 1976; and to report Datran 1975 losses.

MSI Posts Year Earnings in Red Despite Upswing in Fourth Quarter

COSTA MESA, Calif. – MSI Data Corp. managed to improve its fourth-quarter results although it showed a $625,549 loss for the year after a $1.6 million write-off caused largely by its decision to discontinue its Astros supermarket point-of-sale POS business.

Revenues for the year totaled $31.2 million compared with $32.5 million last year. In 1975 the firm earned $1.2 million or 5 cents a share, including a $99,985 credit from the cumulative effect of applying overhead costs to inventories.

The drop in income from continuing operations to $938,805 compared with nearly $2 million last year, resulted principally from an inventory write-off caused by recessionary influences, President W.J. Bowers said.

MSI wrote off $818,000 for obsolete and excessive inventories compared with $150,000 or 8 cents a share last year.

During the fourth quarter, operating income and earnings rose to $493,860 compared with operating income of $236,777 in the same period last year.

But the write-off of Astros-related business diminished the year-ago quarter's earnings to $34,784.

Data 100 Rewrites Credit Terms

MINNEAPOLIS – Data 100 Corp. has renegotiated the terms of its $41 million domestic credit agreement with 11 banks.

This will allow it to continue to use all available sources of nonbank funds, including $10 million in total unused commitments of lease proceeds financing and nonrecourse sales, according to Edward D. Orenstein, president.

Under the new agreement, various ratios are being amended, including the calculation of the amount of committed rental revenue to support the borrowing base.

In April, the firm was granted a waiver of its borrowing base provisions when it exceeded the terms.

Data 100's $19 million revolving credit arrangement in Europe was not affected by the new agreement, which extends through Dec. 31, 1977.

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GRI Computer Corp.'s directors have authorized the purchase of a portion of outstanding 7.5% convertible subordinated debentures due September 1986 in order to reduce sinking fund obligations by retiring outstanding debentures.

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Fujitsu Ltd. said its stock is being listed on the Frankfurt am Main stock exchange.

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Cambridge Memories, Inc. has obtained an $18 million line of credit with three banks.

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Time Brokers, Inc., which markets used computers, has changed its name to Computer Merchants, Inc.

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Anacomp's directors have approved a 5 for 4 split of common. The transaction will be effected through a 25% stock dividend, which maintains the par value per share at $1. The distribution was made April 15 to holders of record March 29.

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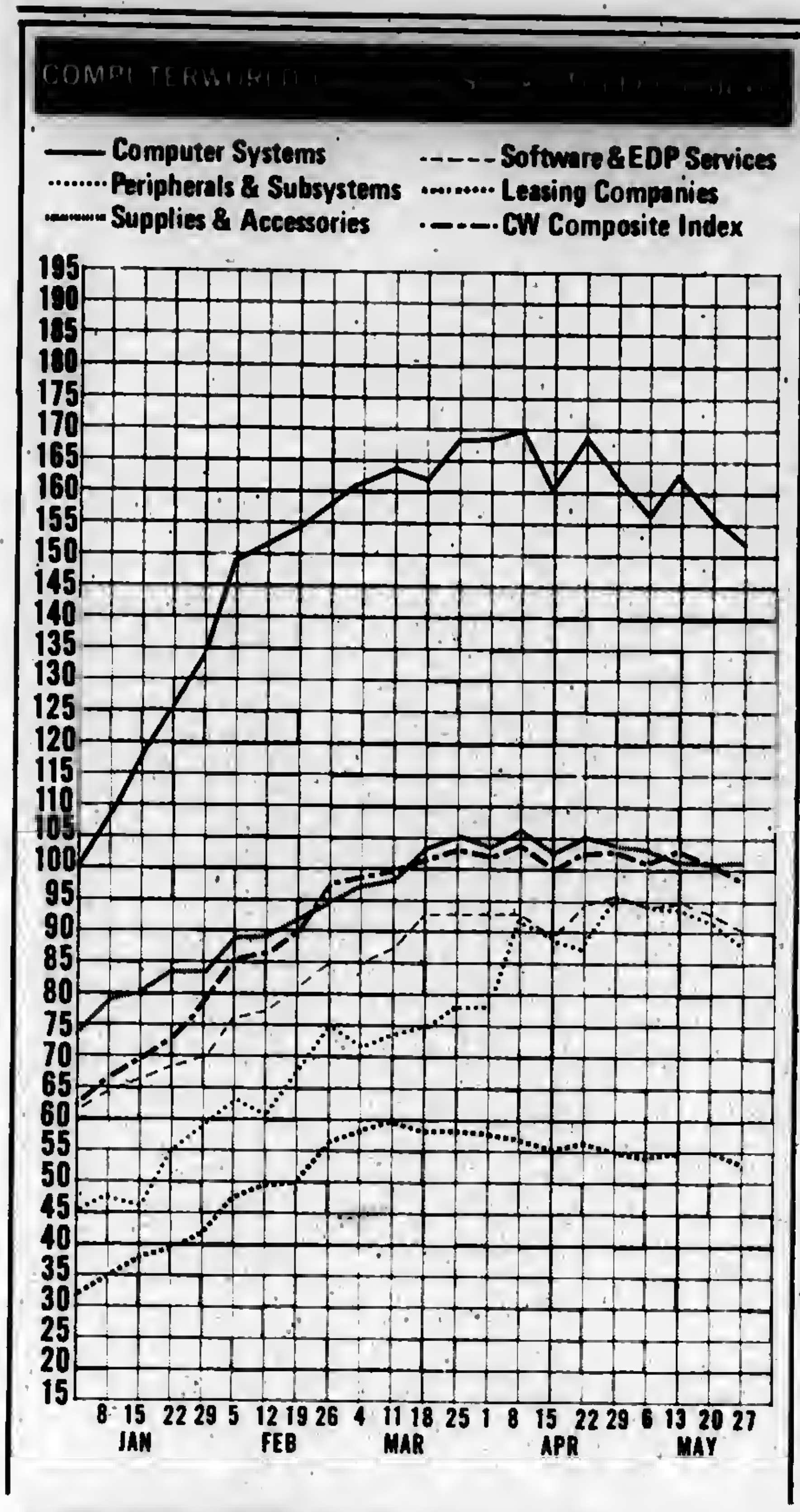

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Three Months Ended March 7

	1976	1975
Shr Ernd	$.27	$.25
Revenue	74,651,000	48,116,000
Earnings	3,555,000	3,120,000
9 Mo Shr	1.09	1.01
Revenue	236,931,000	178,297,000
Earnings	14,455,000	12,453,000

ON-LINE SYSTEMS
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.29	$.35
Revenue	3,220,111	2,892,748
Earnings	246,547	289,006
9 Mo Shr	.54	1.40
Revenue	8,294,102	9,033,530
Earnings	459,960	1,170,328

QUANTOR
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.08	$.08
Revenue	4,000,000	3,512,000
Tax Cred	86,000	84,000
Earnings	208,000	182,000
6 Mo Shr	.12	.12
Revenue	7,449,000	6,331,000
Tax Cred	143,000	142,000
Earnings	327,000	310,000

TEKTRONIX
Three Months Ended March 6

	1976	1975
Shr Ernd	$1.08	$1.04
Revenue	113,846,000	104,610,000
Earnings	9,502,000	9,021,000
9 Mo Shr	a2.44	b2.25
Revenue	270,914,000	254,603,000
Earnings	21,422,000	19,512,000

a-For 40 weeks. b-For 41 weeks.

NATIONAL DATA
Three Months Ended Feb. 29

	1976	1975
Shr Ernd	$.11	$.10
Revenue	8,110,000	7,913,000
Earnings	577,000	542,000
9 Mo Shr	.26	.28
Revenue	24,701,000	23,191,000
Earnings	1,344,000	1,496,000

NATIONAL DATA COMMUNICATIONS
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	.....	$.04
Revenue	$502,758	693,714
Tax Cred	.....	31,799
Earnings	(169,174)	69,635

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 26, 1976

All statistics compiled, computed and formetted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

EXCH		PRICE 1976 RANGE (1)	CLOSE MAY 26 1976	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS		3/4	- 3/4	-3.3
N	BURROUGHS CORP	84-108	95 5/8	-3 7/8	-3.5
O	COMPUTER AUTOMATION	10- 19	15	- 1/2	-3.2
N	CONTROL DATA CORP	18- 27	20 5/8	-1 5/8	-7.3
N	DATA GENERAL CORP	40- 60	51 3/8	-2 1/4	-4.2
O	DATAPOINT CORP	24- 45	38 3/4	-3	-7.1
O	DIGITAL COMP CONTROL	2- 4	3 3/4	0	0.0
N	DIGITAL EQUIPMENT	138-181	160	-3 1/2	-2.1
N	ELECTRONIC ASSOC.	2- 5	3	- 1/8	-4.0
A	ELECTRONIC ENGINEER.	7- 16	14	- 1/2	-3.4
N	FOXBORO	28- 42	40 5/8	- 5/8	-1.5
O	GENERAL AUTOMATION	5- 11	7 1/2	- 1/2	-6.2
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	95-117	102 1/2	-1 7/8	-1.7
N	HONEYWELL INC	34- 56	43 1/8	-2 1/8	-4.6
N	IBM	227-272	250	-3 3/4	-1.4
O	MANAGEMENT ASSIST	1- 3	2	0	0.0
O	MEMOREX	18- 33	27 1/2	-2 1/4	-7.5
O	MICRODATA CORP	10- 26	17 7/8	-2 3/8	-11.7
O	MODULAR COMPUTER SYS	9- 13	10 3/4	+ 3/4	+7.5
N	NCR	24- 31	29	-1	-3.4
O	PRIME COMPUTER INC	4- 11	9 1/4	0	0.0
N	PERKIN-ELMER	19- 27	22 1/4	+3	+15.5
N	RAYTHEON CO	45- 54	53 1/4	+ 1/4	+0.4
N	SPERRY RAND	40- 50	46 3/4	-1 1/2	-3.1
O	SYCOR INC	20- 31	24 3/4	0	0.0
A	SYSTEMS ENG. LABS	6- 10	8 1/4	0	0.0
N	VARIAN ASSOCIATES	13- 17	13 5/8	-1	-6.8
A	WANG LABS.	11- 20	11 1/4	-1 3/8	-10.8
	LEASING COMPANIES		5/8	- 7/8	-6.4
O	COMDISCO INC	3- 10	6 1/2	-1	-13.3
A	COMMERCE GROUP CORP	2- 3	2 3/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	- 1/8	-6.6
N	DATRONIC RENTAL	1- 1	3/4	0	0.0
A	DCL INC	1- 1	5/8	-	-8.2
N	DPF INC	5- 7	5 5/8	0	0.0
A	GREYHOUND COMPUTER	3- 8	7 1/4	- 1/8	-1.8
N	ITEL	6- 13	11 1/4	- 3/8	-3.2
N	LEASCO CORP	6- 14	11 1/8	+ 1/8	+1.1
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NPG INC	1- 1	1/2	- 1/4	-33.3
A	PIONEER TEX CORP	6- 9	8 1/8	+ 1/8	+1.5
N	U.S. LEASING	7- 12	9 3/8	- 1/2	-5.0
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 1/4	0	0.0
A	APPLIED DATA RES.	2- 3	2 3/4	- 1/8	-4.3
N	AUTOMATIC DATA PROC	54- 67	64 7/8	- 5/8	-0.9
O	COLEMAN AMERICAN COS	4- 6	3 1/2	- 1/8	-3.4
O	COMPUTER DIMENSIONS	3- 7	5 3/8	- 1/8	-2.2
O	COMP ELECTION SYSTMS	5- 9	8	-1	-11.1
O	COMPUTER HORIZONS	1- 2	1	- 1/4	-20.0
O	COMPUTER NETWORK	2- 6	4 1/8	- 1/8	-2.9
N	COMPUTER SCIENCES	4- 9	6 1/4	- 1/8	-1.9
O	COMPUTER TASK GROUP	1- 1	1 3/8	0	0.0
O	COMPUTER USAGE	3- 6	3 5/8	+ 5/8	+20.8
O	COMSHARE	2- 7	5 3/4	+ 1/4	+4.5
O	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	12 1/2	- 1/4	-1.9
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	JBS COMPUTER MARKET.	1- 2	1	0	0.0
O	KEANE ASSOCIATES	2- 4	3	- 1/4	-7.6
O	KEYDATA CORP	3- 5	2 5/8	0	0.0
O	LOGICON	4- 4	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/8	- 3/8	-15.0
N	NATIONAL CSS INC	13- 25	19 7/8	- 1/8	-0.6
A	ON LINE SYSTEMS INC	18- 22	19 1/8	- 3/4	-3.7
N	PLANNING RESEARCH	3- 5	3 3/8	- 1/8	-3.5
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	2 5/8	- 1/8	-4.5
O	REYNOLDS & REYNOLDS	13- 21	16 3/4	+ 1/4	+1.5
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
N	TYMSHARE INC	19- 28	25 7/8	+ 7/8	+3.5
A	UPS SYSTEMS	3- 5	3 7/8	+ 1/8	+3.3
N	WYLY CORP	3- 7	3 1/8	- 7/8	-21.8
	PERIPHERALS & SUBSYSTEMS			0	0.0
N	ADDRESSOGRAPH-MULT	8- 13	8 7/8	- 3/8	-4.0
O	ADVANCED MEMORY SYS	4- 10	7 1/2	- 3/8	-4.7
N	AMPEX CORP	5- 8	7 3/8	- 1/8	-1.6
O	ANDERSON JACOBSON	2- 4	3	+ 1/8	+4.3
O	BEEHIVE MEDICAL ELEC	3- 6	6 1/8	+ 3/8	+6.5
A	BOLT,BERANEK & NEW	7- 10	8 1/8	- 1/8	-1.5
N	BUNKER-RAMO	5- 7	5 5/8	- 1/4	-4.2
A	CALCOMP	4- 7	4 1/4	- 1/4	-5.5
O	CAMBRIDGE MEMORIES	2- 6	2 3/4	- 1/2	-15.3
N	CENTRONICS DATA COMP	20- 36	29 5/8	- 3/8	-1.2
O	CODEX CORP	22- 42	36	-2 1/2	-6.4
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 5/8	- 5/8	-14.7
O	COMPUTER CONSOLES	4- 7	6 1/4	- 3/4	-10.7
A	COMPUTER EQUIPMENT	1- 3	1 7/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	1 1/4	+ 1/8	+11.1
O	COMTEN	4- 9	6 7/8	-1 1/8	-14.0
N	CONRAC CORP	20- 25	21	-1	-4.5
O	DATA ACCESS SYSTEMS	1- 3	3 3/4	0	0.0
O	DATA 100	7- 13	9 3/4	- 1/2	-4.8
A	DATA PRODUCTS CORP	5- 11	8 5/8	- 7/8	-9.2
O	DATA TECHNOLOGY	1- 2	1 1/2	- 1/8	-7.6
O	DATUM INC	1- 2	1 3/4	+ 1/8	+7.6
O	DECISION DATA COMPUT	1- 4	1 1/2	- 1/4	-14.2
O	DELTA DATA SYSTEMS	1- 1	3/8	- 1/8	-25.0
N	ELECTRONIC M & M	1- 3	2 3/8	- 3/8	-13.6
O	FABRI-TEK	1- 1	7/8	- 1/8	-12.5
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/4	- 3/4	-7.1
N	HARRIS CORP	34- 48	45 1/4	-1	-2.1
A	INCOTERM CORP	9- 20	11 5/8	- 3/8	-3.1
O	INFOREX INC	3- 7	4 3/8	- 5/8	-12.5
O	INFORMATION INTL INC	10- 18	14 7/8	- 7/8	-5.5
O	INTEL CORP	69-109	69 1/2	- 1/2	-0.7
A	LUNDY ELECTRONICS	4- 7	4 3/4	+ 1/4	+5.5
O	MSI DATA CORP	3- 7	5 3/4	- 5/8	-9.8
A	MILGO ELECTRONICS	15- 20	18 1/4	- 1/2	-2.6
N	MOHAWK DATA SCI	3- 7	5 3/4	+ 1/2	+9.5
O	PENRIL CORP	1- 3	2 1/2	0	0.0
O	PERTEC CORP	3- 8	5	- 5/8	-11.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5 1/2	- 1/2	-8.3
O	QUANTOR CORP	4- 5	4 1/8	- 1/4	-5.7
O	RECOGNITION EQUIP.	6- 11	9 1/8	- 1/4	-2.6
N	SANDERS ASSOCIATES	6- 11	9 1/8	- 3/4	-7.5
O	SCAN DATA	2- 4	2 5/8	+ 3/8	+16.6
O	STORAGE TECHNOLOGY	9- 13	11 5/8	- 3/4	-6.0
O	T BAR INC	6- 10	6 1/4	- 1/2	-7.4
O	TALLY CORP.	4- 6	5 1/8	+ 1/8	+2.5
O	TEC INC	3- 5	4 1/4	0	0.0
N	TEKTRONIX INC	45- 63	59 1/4	-3 1/4	-5.1
N	TELEX	2- 5	3 1/2	- 1/8	-3.4
O	WANGCO INC	11- 22	19	+2 7/8	+17.8
O	WILTEK INC	2- 2	2	0	0.0
	SUPPLIES & ACCESSORIES				
O	ADVANCED SYSTEMS INC	1- 4	3	+ 1/4	+9.0
O	BALTIMORE BUS FORMS	4- 5	4 1/4	0	0.0
A	BARRY WRIGHT	6- 10	8	- 1/8	-1.5
O	CYBERMATICS INC	1- 1	3/4	+ 1/8	+20.0
A	DATA DOCUMENTS	33- 42	35 1/2	0	0.0
O	DUPLEX PRODUCTS INC	17- 24	17	- 5/8	-3.5
N	ENNIS BUS. FORMS	6- 8	6 7/8	- 1/8	-1.7
O	GRAHAM MAGNETICS	9- 13	10	0	0.0
O	GRAPHIC CONTROLS	13- 19	14 1/2	-4 1/2	-23.6
N	3M COMPANY	55- 65	56 1/2	- 7/8	-1.5
N	MOORE CORP LTD	43- 51	42 3/4	-2 3/4	-6.0
N	NASHUA CORP	11- 17	16 1/4	+ 1/8	+0.7
O	STANDARD REGISTER	16- 19	16 1/2	+ 3/4	+4.7
O	TAB PRODUCTS CO	5- 8	7 1/2	0	0.0
N	UARCO	21- 25	23	+ 3/8	+1.6
O	VANIER GRAPHICS CORP	5- 8	6 1/2	0	0.0
A	WABASH MAGNETICS	4- 8	6 1/8	- 1/2	-7.5
N	WALLACE BUS FORMS	19- 25	21 1/2	- 1/4	-1.1

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NEWSPAPER

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.

5/year June 7, 1976 Vol. X, No. 23

Take a Break . . .

NEW YORK – Data processors here this week for the National Computer Conference (NCC) can find computer exhibits elsewhere than in the New York Coliseum. In fact, an exhibit tracing the history of IBM DP equipment can be viewed by those rounding the corner of Madison Ave. and 57th St.

The nine-part display in the IBM exhibit center's street-level showcase windows illustrates how data processing has declined in cost, become more efficient and easier to apply through advances in technology.

Over 160 items, including actual computer elements, are on display.

Replicas of the first punched card equipment invented by Herman Hollerith and used in the 1890 census are on view, as is a tabulator developed 40 years later using relays which could add numbers at the rate of 150 a minute.

Univac Announces 90/80 As NCC Gets Under Way

By Ronald A. Frank
Of the CW Staff

NEW YORK – Univac will introduce the large-scale virtual 90/80 system designed to provide an upgrade for existing Univac and IBM 370/145 sites at the National Computer Conference here this week.

The 90/80 is the first Univac mainframe to use emitter-coupled logic (ECL) circuitry, the company noted.

The CPU has two specialized processors in what Univac described as distributed function architecture. An instruction processor executes command, control and arithmetic instructions; a peripheral processor executes instructions for the input and output of data.

Each processor operates without interference from the other, Univac said.

The 90/80 is fully upward-compatible with the 90/60 and 90/70 medium-scale systems and the Series 70, which includes former RCA systems, according to Univac. These earlier systems use the VS/9 virtual operating system which runs on the 90/80 and is said to provide a multienvironment system for batch, remote batch and transaction processing.

The 90/80's semiconductor main memory starts at 542K bytes and can be expanded to 4.1M bytes in increments of 524K. Memory cycle time is 450 nsec for eight bytes, while the instruction processor has a cycle time of 98 nsec, the vendor said.

The 90/80 is aimed at upgrading the IBM DOS/VS user of the 370/135 and 145. Depending on configuration, this user can save up to 25% over a 370/158 system with comparable processing power, a Univac spokesman estimated.

Present users of the IBM 360/65 and 370/155 operating in an MFT/MVT environment could also save money by upgrading to the 90/80, he said. As an upgrade for current Univac Series 90 users, the 90/80 is said to have 2.5 times the CPU power of the 90/70.

Although the 90/80 is oriented to virtual operation under the VS/9 operating system, it will also run with the earlier OS4 software in nonvirtual mode, the spokesman said.

Communicating Method

To emphasize the communications capabilities of the 90/80, Univac introduced the Virtual Integrated Communications Access Method (Vicam) for inquiry/response, queued message processing, multiple destination routing and transaction-oriented processing.

This access method, which operates under VS/9, is an upgrade for the earlier Icam software, Univac said, adding the 90/80 can support up to 256 communications lines via multichannel communications controllers.

The recently introduced UTS 400 and 700 terminals [CW, May 10] can operate on the 90/80, as can the earlier Uniscope and DCT series terminals. Most mainframe peripherals from Univac can run on the 90/80 including the recently unveiled

(Continued on Page 5)

Calls IBM Arguments 'Frivolous'

Judge Allows U.S. to Use FBI in Trial

By Nancy French
Of the CW Staff

NEW YORK – A federal judge has rejected as "frivolous" and "not persuasive" IBM's arguments against the government's use of agents of the Federal Bureau of Investigation (FBI) to interview IBM trial witnesses in the antitrust suit against it here.

In an opinion handed down by Judge David N. Edelstein during the current trial recess, ground rules were set down that apply to witness interviews conducted by both parties, bringing to an end a dispute that began about a month ago [CW, May 17].

The government plans to use the FBI to interview 131 of IBM's 400 trial witnesses.

In its motion to the court, IBM counsel argued that FBI interviews are inherently coercive and abusive; FBI interview reports are unfair, secret weapons in the hands of government counsel; and use of the FBI fundamentally impairs IBM's ability to defend itself.

Furthermore, use of the FBI violates the Publicity in Taking of Evidence Act since the interviews are "virtually depositions" and not interviews, IBM said.

"Whatever the validity of IBM's arguments" about the FBI's abuse of power in other circumstances, "such an assertion cannot support the proposition [the FBI] is inherently coercive," Edelstein said.

He rejected IBM's claim that witnesses feared the FBI would retain a record of a witness' refusal to cooperate. "The FBI does not retain such information in its files," Edelstein said. IBM's claims of apprehension on the part of witnesses is "insufficient support for the claim that no true consent hy the witness is obtainable," he said.

'Good-Faith Error'

The incident described by IBM in which an agent was alleged to have incorrectly told a witness IBM knew or approved of the FBI interviewing practice was "a good-faith error," Edelstein said.

"Government counsel have taken steps to ensure that such an incident is not repeated," Edelstein said.

In its motion, IBM claimed FBI interviews abridged its right to a fair trial because it could result in witnesses asking to be withdrawn from the case.

Edelstein said he would hear IBM's complaints of FBI conduct only to the extent that it violates IBM's rights. However, IBM "has no standing" to assert alleged

(Continued on Page 4)

OS/VS2 Release 3.7 Enhances Scheduler, Supervisors, JES2

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. – Release 3.7 of OS/VS2, announced late last month by IBM, provides the large-scale 370 user new capabilities in Job Entry System 2 (JES2), enhancements to Scheduler and Supervisor and a new data management element, according to the vendor.

Concurrent with the introduction of the operating system release, IBM also announced a change in its packaging and method of distributing the system software. With the change, various features,

(Continued on Page 8)

Groups Join Forces to Counter Bell Efforts to Pass Reform Act

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Companies and organizations threatened by the Consumer Communications Reform Act have begun a campaign to block the passage of the AT&T-sponsored legislation.

Both equipment suppliers and specialized carriers have begun to speak out in an effort to blunt the efforts that have been mounted by the Bell System and other members of the telephone industry [CW, May 24].

Five specialized carriers have formed the Ad Hoc Committee for Competitive Telecommunications (ACCT). "We are convinced the legislation is both anticonsumer and antireform. If enacted, the act would eliminate even the limited freedom of choice now enjoyed by increasing numbers of communications users," the carriers said.

The telephone industry has launched a "carefully orchestrated lobbying and public relations campaign. . .to create a false sense of urgency" to force hasty Congressional action in an election year, ACCT said.

At the same time, the Independent Data Communications Manufacturers Association (IDCMA) issued a statement which said; "AT&T has been using the funds of the very residential and rural users it claims to defend in a campaign organized to increase its monopoly hold upon a wide range of equipment and services."

The computer industry could be especially hard hit by the passage of the proposed legislation because terminal equipment including computers and "a wide range of peripherals" could be brought under the control of state regula-

(Continued on Page 4)

This is the third in a series of articles describing the efforts being expended behind the scenes to inform Washington legislators and others about the pros and cons of the Consumer Communications Reform Act of 1976, now pending in both houses of Congress.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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Appeals Court Hears IBM vs. Catamore

By Molly Upton
Of the CW Staff

BOSTON – Round two of the IBM vs. Catamore Enterprises, Inc. case took place here last week when attorneys for both sides presented arguments before the three-judge panel of the U.S. Court of Appeals for the First Circuit.

The presentations essentially outlined the contents of the respective sides' briefs [CW, April 26], interspersed by questions from the panel on the conduct of the trial, the demand for the jewelry manufacturer's products and the need for a written 1969 systems engineering services (SES) agreement.

Calling the case essentially a contract claim, Jack E. Brown of Brown & Bain argued for IBM that the admission by Judge Raymond J. Pettine of the oral agreements between IBM and Catamore was improper.

Submission of such points to the jury represented a violation of contract law, he said, because the agreements touched on the same subject matter.

Furthermore, he argued, the language of the SES agreement stated succinctly in bold face type: "The customer acknowledges that he has read this Agreement, understands it and agrees to be bound by its terms and further agrees that it is the complete and exclusive statement of the agreement between the parties, which supersedes all proposals oral or written and all other communications between the parties relating to the subject matter of this Agreement."

"Catamore's refusal to read can't be made into a rule of law," Brown said.

Fraud Charge an 'Afterthought'

Furthermore, Brown said, the year specified in the contract within which Catamore could rightfully bring charges against IBM for damages arising from the contract had expired.

For this reason, Catamore added the charge of fraud, he said. "The allegation of fraud [was] an afterthought . . . If this is the way to get around a written contract, then where is the sanctity?" of contract law, he asked.

Also, Catamore should not have been allowed to avoid the limitations of the SES agreement by amending its complaint to include the charge of negligence, Brown argued. He cited Pettine's charge to the jury as being remiss on this point.

Catamore attorney Thomas K. Christo argued IBM had not previously objected on this point, so the argument was therefore inappropriate at the appeals hearing.

Catamore's attorneys argued the written agreement covered only 10% of the work which IBM had previously orally agreed to supply. Therefore, IBM's failure to deliver a production control system was not governed by the limitations of the written contract.

Albert P. Zabin, a colleague of Christo, said the SES agreement by itself was not a contract.

Since IBM never performed any part of the oral agreement, it became impossible to deliver the final 10%, he said, contending IBM cannot claim the argument is only over the remaining 10% that wasn't delivered.

Catamore Brief Claims Jury Had 'Ample Evidence' to Find Fraud

By a CW Staff Writer

BOSTON – The jury that awarded $11.4 million to Catamore Enterprises, Inc. in the IBM vs. Catamore case was presented with "ample evidence" to conclude "that IBM obtained the December 1969 systems engineering services [SES] agreement by fraud," according to a brief Catamore filed with the appeals court that heard the case here last week.

As a result, the clauses limiting IBM's liability on two contracts with Catamore and its subsidiary and void, the Providence R.I. jewelry manufacturer said.

The brief, which followed the opening round of the appeals process instituted by IBM, rebutted several of the charges made by IBM in its attempt to seek a new trial or have the verdict overturned [CW, April 26].

In addition to upholding the verdict and calling the case "untainted by error," the Catamore brief declared the oral agreements for services made in 1968 between Catamore and IBM were admissable as evidence.

IBM, both in court and later in its appeal, stated such admission was improper.

Catamore's brief claimed some of the arguments in the IBM appeals brief were improper and could not be considered since these issues had not been raised during the trial.

The damage award of $11.4 million was the result of "careful and adequate documentation and expert testimony based on a fully adequate data base and unobjectionable and essentially unobjected-to instructions from the court," Catamore said.

The Catamore suit, initiated after IBM sued to collect the $68,453 it said Catamore owed, charged IBM with misrepresentation, fraud, negligence and breach of contract.

Catamore claimed damages totaling $26.2 million because, it said, it had never obtained a working production control system or merchandise control system.

Commenting on remarks made about the damage award in the IBM brief's preface, the Catamore filing said IBM, "under the guise of arguing questions of law, essentially argues about the weight of the evidence."

Turning to the issue of damages, Catamore stated "it is not often that one finds a blatant appeal to emotions in an appellate brief, but that is what is found [in a section] IBM's brief.

"The comparisons that it makes are designed obviously to try to stir the emotions of the court. Most of the statements about the case in this section are either inaccurate or totally unsubstantiated by any evidence and, indeed, there is but one reference to the testimony.

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Ad Hoc Committee Formed

Groups Join Forces to Counter Bell Lobbying Efforts

(Continued from Page 1)

tory agencies, IDCMA said.

"The public will ultimately bear the burden of the extension of monopoly power expounded by this legislation," the vendor organization warned.

Working to Limit AT&T Control

In addition to opposing the AT&T-sponsored legislation, some groups are countering the telephone industry in other ways. The Computer Industry Association (CIA) has been working for some months with the Senate Antitrust and Monopoly Subcommittee to draft legislation that would limit the monopoly control of the telephone company.

The proposed legislation has not yet been introduced in Congress, but it would place the telephone companies under the Public Utility Holding Company Act of 1934. This would prohibit horizontal and vertical integration and in effect require AT&T to divest itself of Western Electric, allowing the manufacturing affiliate to compete like any other company, a CIA spokesman said.

Under this proposal the Bell operating companies would no longer be part of the Bell System, and they would be allowed to purchase equipment on a competitive basis instead of only from Bell suppliers.

The CIA is expected to release additional information on its legislative work soon, but a spokesman emphasized that the work with the Senate subcommittee had begun some time before the first version of the Consumer Communications Reform Act was introduced.

Another organization concerned about the impact of the proposed Congressional legislation is the Computer Business Equipment Manufacturers Association (Cbema). A spokesman said the industry group certainly does not favor the bills now pending because of the restrictions that would be placed on Cbema members. The group will make its position known in the near future in more detail, he said.

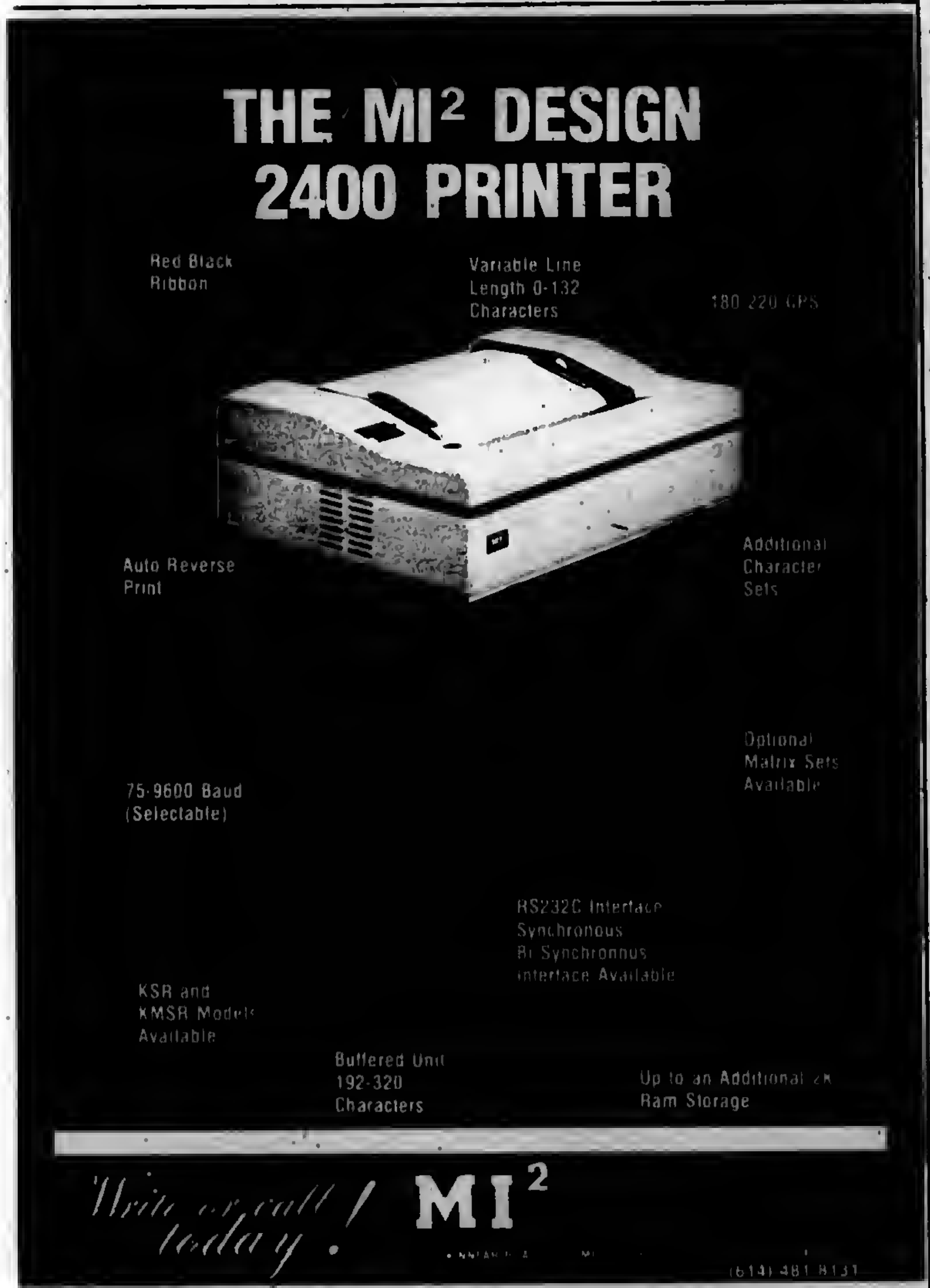
Related Move

In a related move, Sam Wyly, president of Data Transmission Co. (Datran), wrote to the Federal Communications Commission (FCC) proposing that the commission require AT&T and its operating companies "to account fully for all activities involved" with efforts related to the Consumer Communications Reform Act. These reports should clearly describe each activity, the number of officers and/or employees involved in the activity, wage and other expenses and the costs of the legislative efforts, Wyly said.

"There is a legitimate substantial regulatory question as to whether the captive ratepayers of the telephone monopoly should be the ones to underwrite the multimillion-dollar costs of the political action program." These are costs which have no relationship to the rendition of communications services for which the public must pay, Wyly said.

"Because of the pervasiveness of the telephone monopolies, program of propaganda and indoctrination, it is practically impossible to identify or quantify all of the many facets of that program. But it is common knowledge that for well over a year AT&T has sought to involve its 3 million shareholders by. . .a systematic program of management visitations to each of them. Its efforts have included the regimentation of its 1 million employees and their labor unions," the Datran chief said.

Wyly also charged AT&T has been making "unstinted use" of the printed and broadcasting media to get its message across to the general public. And Bell has given "concerted and continuous attention to almost all members of the Congress as well as state and local legislators on virtually a one-to-one basis of personal contact," he charged.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Judge Rejects IBM Arguments Against U.S. Use of FBI Agents

(Continued from Page 1)

violations of the rights of its witnesses, he said.

Perjury Sanctions

IBM had argued that introduction of the FBI into the case subjects IBM witnesses to the threat of perjury sanctions for false statements made to FBI investigators, Edelstein noted.

However, false statements made to any agent of the Department of Justice, including Antitrust Division attorneys, would be subject to the same penalties, he said.

Since the interviews in question are voluntary, are not conducted under oath, and no verbatim transcription is made by the interviewer, it is questionable whether the reports of these interviews would form the basis of a conviction under U.S. code, Edelstein's opinion said.

Speculation Offered

IBM offers nothing more than speculation and unreasonable inferences and does not persuade the court to enjoin further use of the FBI and possibly impair dramatically the government's attempt to implement its right to interview the defendant's witnesses, Edelstein said.

Edelstein ordered both parties to inform their witnesses of the following:

- They have been designated as trial witnesses (for whichever side has called them), and they are not under the control of the party designating them as witnesses.
- If they are willing, they will be interviewed by attorneys for IBM, attorneys for the government or the duly authorized representative of either side, including FBI agents, economists, technical representatives or paralegals working under the direction and guidance of lawyers representing parties to this litigation.
- Interviews with either side are "entirely voluntary," and witnesses are free to impose whatever conditions they chose upon such an interview. Any questions concerning granting or refusing to grant an interview may be directed to the witnesses' attorneys or to the attorneys for either party.
- In the event that the conduct of any person either in arranging or conducting an interview is coercive or intimidating, a witness may immediately terminate contact with that person and report the occurrence of such an event to the witness' own counsel or the counsel for the party that designated him as a witness.
- Whenever counsel for the adverse party or one of its agents contacts a trial witness of the opposing party, such counsel or agent shall identify his relationship with the party on whose behalf the interview is sought.

IBM to Appeal Order to Relinquish Documents to U.S.

NEW YORK – IBM has informed the judge hearing the U.S. government's antitrust case against the corporation that it will appeal his order requiring it to turn over documents it considers privileged to the Justice Department.

Judge. David N. Edelstein issued an order on May 14 instructing IBM to begin giving some 21,800 documents to the government within 15 days. The documents are those whose claims of privilege were reviewed by "special masters," judges assigned by Edelstein to determine if the papers really should be kept confidential.

The special masters have been working on these questions of privilege on the basis of attorney-client privilege since the spring of 1973, and they have completed their review and filed their reports with Edelstein.

Presented with about 26,362 documents in the fall of 1974, the masters found 2,173 to be privileged.

Appealed 90% of Rulings

IBM appealed the rulings of the special masters on about 90% or about 21,800 documents of those not held privileged and therefore confidential.

In his may 14 opinion, Edelstein said "the appeal of many of these 21,800 documents is meritless. It is an attempt to relitigate issues already decided by this court."

Specifying particular categories of documents, the judge ordered IBM to produce these papers to the Justice Department, and it is this order that IBM is appealing.

This move represents yet another mandamus action against the district court judge. IBM last asked for and received a reversal of Edelstein's orders in October [CW, Nov. 12].

SSA Ordered to Give SSNs to Locator Service

WASHINGTON, D.C. – The battle over whether the Social Security Administration (SSA) should provide Social Security numbers (SSN) to help the Parent Locator Service find deserting parents whose families receive welfare has been resolved in favor of the Parent Locator Service.

The Department of Health, Education and Welfare (HEW) recently published a regulation requiring the SSA to provide the SSNs to the Social and Rehabilitation Service (SRS) as a "routine use" allowed under the Privacy Act of 1974.

The SRS is the HEW unit which provides welfare money and services to the states.

The dispute revolved around which law took precedence – the Privacy Act, which made disclosure of personal information illegal except for predefined "routine uses," or the 1974 amendments to the Social Security Act, which set up the Parent Locator Service and required the SRS to use Federal government resources to locate deserting parents.

Those resources included a time-shared network and the master files of the SSA and the Internal Revenue Service [CW, April 23, 1975].

The SSA amendments did not specifically require the SSA to turn over SSNs, but did call for the HEW Secretary to use "all information at his disposal" to assist in the program, according to HEW spokesman Ed Gleiman.

Univac to Announce 90/80 System at NCC

(Continued from Page 1)

6,250 bit/in. tape drives [CW, May 24].

The 90/80 utilizes Codasyl versions of Cobol and Fortran as well as the data management system DMS/90. Under the VS/9 Personal Data Processing feature and the Unique inquiry language used in the Information Management System (IMS/90), the 90/80 is oriented "toward a personal computing facility," Univac said.

Applications packages are available for manufacturing, civil engineering, distribution and other industries.

Purchase prices for the 90/80 range from $2 million to $4 million dollars while monthily rental on one-year leases range from $43,000 to $96,000. A typicai IM-byte 90/80 with the usual peripherals and software costs about $43,000/mo.

Lease plans up to five years are available. First deliveries are scheduled for the fourth quarter, according to the firm, which can be reached through P.O. Box 500, Blue Bell, Pa. 19422.

Correction

Memorex Corp.'s Model 3640 disk drive can be attached to IBM 370/115s and up [CW, May 24].

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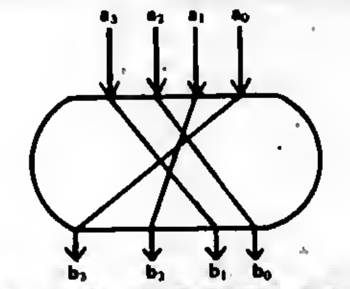
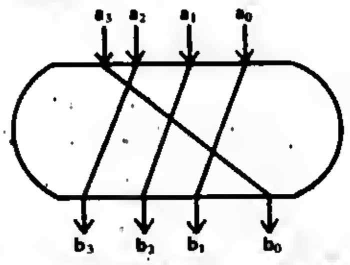
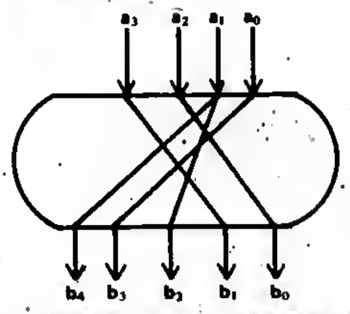


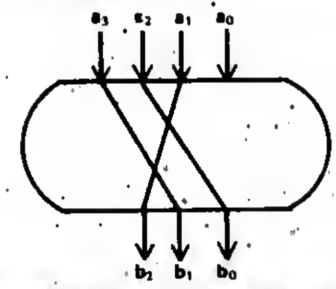
(a) BALANCEO – SAME NUMBER OF BITS IN INPUT ANO OUTPUT. THIS PERMUTATION IS INVERTIBLE, BECAUSE EACH INPUT BIT IS TIEO TO ONE OUTPUT BIT.



(b) CYCLIC – CYCLE LEFT 1 BIT IS ILLUSTRATED

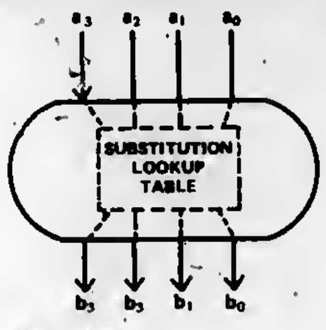


(c) EXPANDED – OUTPUT HAS MORE BITS THAN INPUT

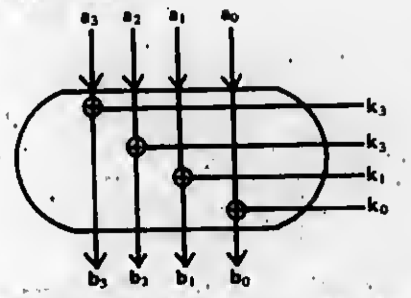


(d) CONTRACTED – OUTPUT HAS FEWER BITS THAN INPUT.

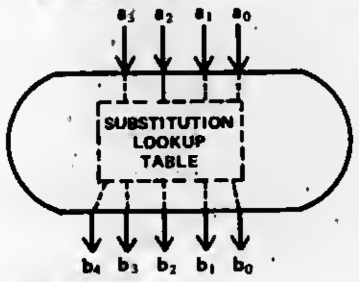
FIGURE 1
PERMUTATIONS WITH 4-BIT INPUTS



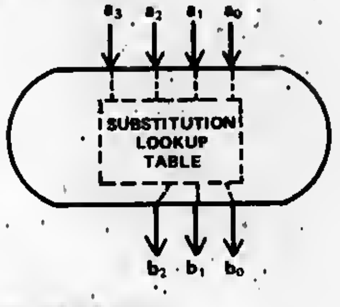
(a) BALANCED



(b) EXCLUSIVE OR (MOOULO 2 BIT-BY-BIT AODITION)



(c) EXPANDEO



(d) CONTRACTEO

FIGURE 2
SUBSTITUTIONS WITH 4-BIT INPUTS

NBS Standard Puts Encryption In DP Systems

By Mal Stiefel

Special to Computerworld

The National Bureau of Standards (NBS) published a proposed standard in the *Federal Register* of Aug. 1, 1975 specifying "a mathematical algorithm for encrypting (enciphering) and decrypting (deciphering) binary-coded information" for federal use.

The process is intended to be implemented "in a special-purpose electronic device. . .designed in such a way that it may be embedded in a computer system or network and provide cryptographic protection to binary-coded data.

"The method of implementation, the control of the cryptographic device and the interface of the device to its associated equipment will depend on the application and environment. . . Certification of compliance with this standard is the responsibility of the designer and manufacturer of the device."

Basic Principles

Figures 1 and 2 illustrate the various data manipulation functions found in the algorithm. The permutations in Figure 1 involve rearrangements of bits without changing their value, while the substitutions (also called ciphers) do not generally pre-

(Continued on Page 7)

$a_2\ a_1\ a_0$	0	1	2	3	4	5	6	7
$b_2\ b_1\ b_0$	6	5	1	4	7	0	3	2

(a) BALANCED, INVERTIBLE

$a_2\ a_1\ a_0$	0	1	2	3	4	5	6	7
$b_2\ b_1\ b_0$	5	2	7	6	3	1	0	4

(b) INVERSE OF (a) ABOVE

$a_2\ a_1\ a_0$	0	1	2	3	4	5	6	7
$b_2\ b_1\ b_0$	6	5	1	4	7	6	3	5

(c) BALANCED, NOT INVERTIBLE

$a_2\ a_1\ a_0$	0	1	2	3	4	5	6	7
$b_2\ b_1\ b_0$	5	4	7	6	1	0	3	2

(d) EXCLUSIVE OR, USING A KEY VALUE OF $k_2\ k_1\ k_0 = (101)_2 = (5)_8$ (NOTE SYMMETRY OF INPUT-OUTPUT PAIRS. THE INVERSE OF THIS TRUTH TABLE IS EOUAL TO THE ORIGINAL.)

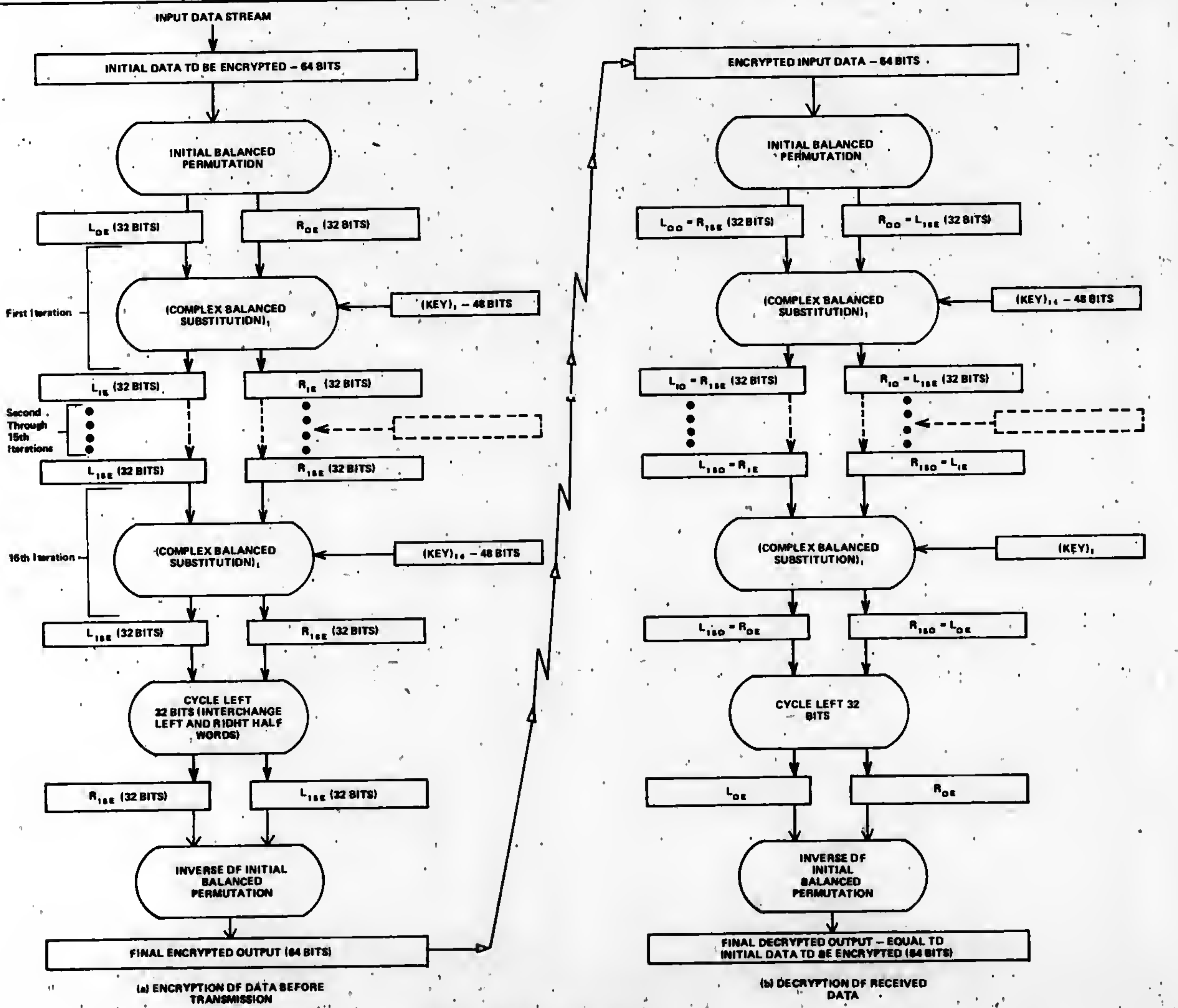
$a_2\ a_1\ a_0$	0	1	2	3	4	5	6	7
$b_3\ b_2\ b_1\ b_0$	C	5	2	4	E	6	A	0

(e) EXPANDED (4-BIT OUTPUT VALUES SHOWN IN HEXIDECIMAL NOTATION)

$a_2\ a_1\ a_0$	0	1	2	3	4	5	6	7
$b_1\ b_0$	3	1	1	0	3	2	3	1

(f) CONTRACTED (2-BIT OUTPUT)

FIGURE 3
TYPICAL TRUTH TABLES FOR THE CLASSES OF SUBSTITUTIONS ILLUSTRATED IN FIGURE 2, WITH 3-BIT INPUTS. INPUT AND OUTPUT VALUES ARE GIVEN OCTAL NOTATION UNLESS OTHERWISE NOTED.



INPUT DATA STREAM
INITIAL DATA TO BE ENCRYPTED – 64 BITS
INITIAL BALANCED PERMUTATION
L_{0E} (32 BITS)
R_{0E} (32 BITS)
First Iteration
(COMPLEX BALANCED SUBSTITUTION)$_1$
(KEY)$_1$ – 48 BITS
L_{1E} (32 BITS)
R_{1E} (32 BITS)
Second Through 15th Iterations
L_{15E} (32 BITS)
R_{15E} (32 BITS)
16th Iteration
(COMPLEX BALANCED SUBSTITUTION)$_1$
(KEY)$_{16}$ – 48 BITS
L_{16E} (32 BITS)
R_{16E} (32 BITS)
CYCLE LEFT 32 BITS (INTERCHANGE LEFT AND RIGHT HALF WORDS)
R_{16E} (32 BITS)
L_{16E} (32 BITS)
INVERSE OF INITIAL BALANCED PERMUTATION
FINAL ENCRYPTED OUTPUT (64 BITS)
ENCRYPTED INPUT DATA – 64 BITS
INITIAL BALANCED PERMUTATION
$L_{00} = R_{16E}$ (32 BITS)
$R_{00} = L_{16E}$ (32 BITS)
(COMPLEX BALANCED SUBSTITUTION)$_1$
(KEY)$_{16}$ – 48 BITS
$L_{10} = R_{15E}$ (32 BITS)
$R_{10} = L_{15E}$ (32 BITS)
$L_{150} = R_{1E}$
$R_{150} = L_{1E}$
(COMPLEX BALANCED SUBSTITUTION)$_1$
(KEY)$_1$
$L_{160} = R_{0E}$
$R_{160} = L_{0E}$
CYCLE LEFT 32 BITS
L_{0E}
R_{0E}
INVERSE OF INITIAL BALANCED PERMUTATION
FINAL DECRYPTED OUTPUT – EQUAL TO INITIAL DATA TO BE ENCRYPTED (64 BITS)

(a) ENCRYPTION OF DATA BEFORE TRANSMISSION

(b) DECRYPTION OF RECEIVED DATA

FIGURE 5 – ENCRYPTION AND DECRYPTION

Encryption Standard May Force Change In Systems Design

(Continued from Page 6)

serve bit values between input and output.

In fact, an invertible balanced permutation (Figure 1a) may be regarded as a balanced substitution (Figure 2a) in which the number of output 1s is equal to the number of input 1s and the number of output 0s is equal to the number of input 0s for every input bit combination.

The distinction between an invertible process and a noninvertible process may be seen in figures 3a, 3b and 3c. In Figure 3a, every output bit combination (000, 001 . . . 111) occurs only once, and every input bit configuration has a corresponding output.

With these characteristics, the inverse of the process can be constructed, as shown in Figure 3b.

By contrast, the process shown in Figure 3c is not invertible because the output configurations 110 and 101 occur twice and the configurations 000 and 010 do not occur at all.

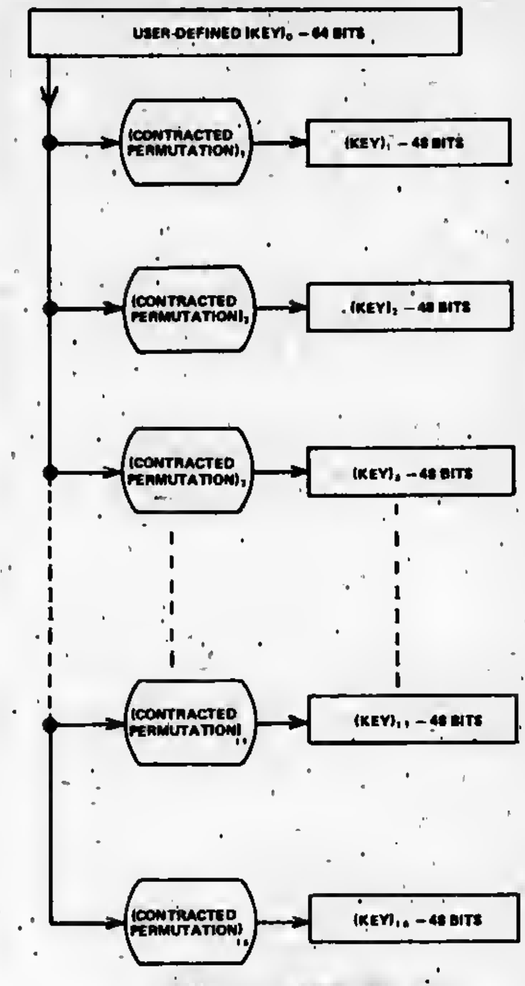

USER-DEFINED (KEY)$_0$ – 64 BITS
(CONTRACTED PERMUTATION)$_1$
(KEY)$_1$ – 48 BITS
(CONTRACTED PERMUTATION)$_2$
(KEY)$_2$ – 48 BITS
(CONTRACTED PERMUTATION)$_3$
(KEY)$_3$ – 48 BITS
(CONTRACTED PERMUTATION)$_{15}$
(KEY)$_{15}$ – 48 BITS
(CONTRACTED PERMUTATION)$_{16}$
(KEY)$_{16}$ – 48 BITS

FIGURE 4 – KEY GENERATION (PERFORMED ONCE WHENEVER A NEW KEY IS DEFINED BY THE USER.)

Thus, if an attempt were made to construct the inverse of Figure 3c, the outputs would be undefined for input values of 000, 010, 101 and 110.

The invertibility property may also be applied to permutations. A permutation is invertible if each input bit is tied to one and only one output bit.

The cyclic permutation, Figure 1c, is a special case of an invertible balanced permutation. The inverse of Figure 1c would be a "cycle right 1 bit" process.

As indicated in Figure 2, substitution may be regarded as a table lookup procedure which could be used if the function were performed by a microprocessor or could be realized by a network of logic gates.

As indicated in the standard, the method of implementation is up to the individual hardware designer.

Taking this one step further, there's no reason why such a function can't be executed by software on a general-purpose computer, although dedicated custom-tailored hardware will accomplish the task most efficiently.

The most intriguing class of substitution, the exclusive OR process, is shown in Figure 2b; a typical truth table is given in Figure 3d.

The process is not only invertible but

(Continued on Page 9)

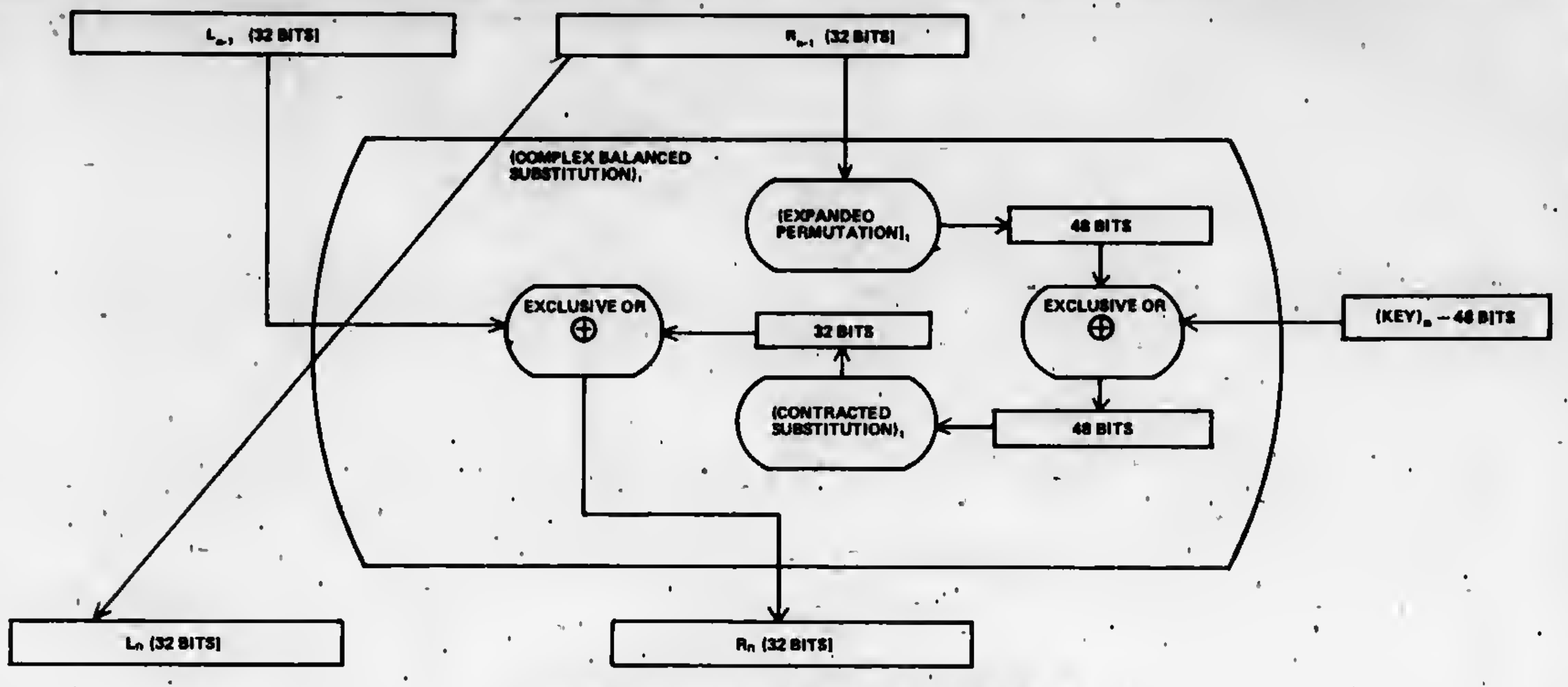


FIGURE 8 – DETAILS OF Nth ITERATION IN ENCRYPTION PROCESS

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OS/VS2 Release Enhances JES2 For 370 Users

(Continued from Page 1)

including all those introduced with Release 3.7, will be user-selectable without requiring a full-blown system generation, a spokesman said.

The OS/VS2 update features JES2 Release 4, under which JES support for IBM 3340 and 3350 direct-access storage devices includes a technique of track address allocation called Track Celling and provides simultaneious formatting of spool volumes, IBM said.

The installation procedure for JES2 has been simplified by eliminating JES2 generation parameters. Release 4 will use parameters defined by the system initialization parameter library to establish table values at initialization time rather than building the system through parameters set at generation time.

MVS Scheduler Enhancements

MVS Scheduler enhancements include improvement of the device allocation segment by reducing its use of other services.

Under Supervisor I, the way the I/O supervisor manages its memory has been improved with the intention of reducing the I/O path length in the system, the spokesman added.

The System Resource Manager has been extended, with additional control mechanisms to allow better installation control over the mixture of jobs being executed, he said. The Auxiliary Storage Manager has been enhanced to reduce CPU and fixed real storage required to do system paging and system swapping, he continued.

The newly implemented data management element inlcudes RESET CAT, an access method command which provides capabilities to reestablish a Vsam catalog.

Also included is an extended MVS Control Volume (Cvol) capability that provides OS Cvol support in MVS environments equal that already available in SVS situations, while retaining the Vsam master catalog as the only system master catalog.

In addition to the Release 3.7 features, some available previously are also "selectable units" under this plan as long as the user has 3.7 installed, IBM said.

OS/VS2 Release 3.7 is available now, IBM added.

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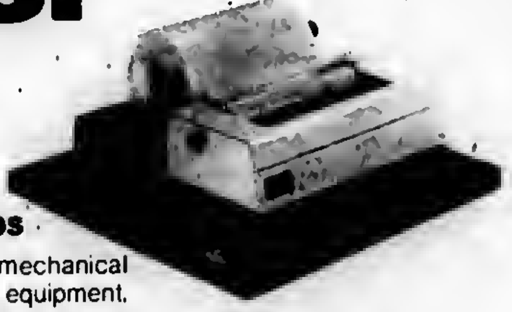

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NBS Standard Details Federal Data Encryption

(Continued from Page 7)

self-invertible. Suppose an input bit sequence of:

$a_n, a_{n-1}, \ldots, a_1, a_0$

produces a given output sequence of:

$b_n, b_{n-1}, \ldots, b_1, b_0$

If, instead,

$b_n, \ldots b_0$

is applied as the input, the output will be

$a_n \ldots a_0$

The process may be generated by a circuit which has two inputs – data and a key with equal numbers of bits. Then the output is obtained by a bit-by-bit modulo-2 addition (exclusive OR) of the key bits and data bits.

The bit-by-bit transfer functions is given by:

$0 \oplus 0 = 0;$
$0 \oplus 1 = 1;$
$1 \oplus 0 = 1;$
and
$1 \oplus 1 = 0,$

where the $\oplus$ sign symbolizes the exclusive OR operation.

In the encryption algorithm, as we shall see, the remarkable properties of the exclusive OR circuit permit a common logic to be used for encryption at one end of a transmission line and decryption at the other end.

To look at the exclusive OR process in another light, it may be noted that, if Figure 3a represented the truth table of an exclusive OR function, then Figures 3a and 3b would have been identical.

The expansion and contraction operations, where the number of output bits is not equal to the number of input bits, are used in several stages in the algorithm, along with balanced operations.

Two-Part Algorithm

The algorithm is composed of two distinct subfunctions: key generation and encryption/decryption.

Key generation (Figure 4) is the process of transforming a user-defined 64-bit key into a set of 16 different 48-bit keys, each to be used in a different iteration of the encryption/decryption procedure.

The proposed standard defines the input/output relationships of all the contracted permutations given in Figure 4, as well as all of the other permutations and substitutions of the algorithm. The substitutions (other than exclusive OR) are defined in truth tables, as in Figure 3, and the permutations are delineated by showing tables of input/output bit "connections," illustrated symbolically in Figure 1.

Each contracted permutation in Figure 4 is actually composed of a balanced permutation followed by a cycle left operation and a contracted permutation. The result is logically equivalent to a series of contracted permutations, as indicated in the figure.

Strictly speaking, a user could supply $(\mathbf{KEY})_1$ through $(\mathbf{KEY})_{16}$ directly, without building the hardware to perform the permutations, since all of the 48-bit keys can be predicted for any given 64-bit master key.

For example, an off-line program could easily print a series of keys that could be loaded simultaneously into the 48-bit registers, for each of a limited number of master keys.

Such an approach may be reasonable because the intent of the algorithm appears to be to use a given master key over a long period of time – a matter of hours, days or weeks, for instance.

This conclusion is inferred from the language of the proposed standard, which states, "Data may be protected against unauthorized disclosure by generating a random key and issuing it to the authorized users of the data."

This indicates it isn't necessary to supply a new 64-bit key for every 64-bit data block. That would require synchronization of the encrypting and decrypting key generators so the same key could be used to encipher and decipher each data block.

Instead, a federal agency with a time-sharing system or a remote batch operation can select, for example, a daily key to be used at each transmitting site and the central processing facility. Obviously, any private organization choosing to adhere to the standard can use the same technique for its own operations.

The encryption/decryption process itself is shown in Figure 5. It consists of several steps to be performed on each 64-bit input data block: an initial balanced permutation; a series of 16 iterations of a complex cipher, each iteration using a separate 48-bit key; a cycle left 32 bits (nothing more than an interchange of the left and right half-word); and a final balanced permutation which is chosen to be the inverse of the initial balanced permutation.

The decryption process uses precisely the same bit manipulation stages as the encryption algorithm. The only difference is that the keys are used in the reverse order, beginning with $(\mathbf{KEY})_{16}$ and ending with $(\mathbf{KEY})_1$.

Figure 6 shows the n^{th} iteration in the encryption process, a complex function that encompasses permutation, substitution, expansion and contraction.

If the same process is used for decryption, it can be shown that:

$$L_{OD}\ (\text{decryption}) = R_{16E}\ (\text{encryption})$$

$$R_{OD} = L_{16E},\ L_{ID} = R_{15E}$$

and so on. Thus, following the final exchange of left and right half-words and the final permutation, the output of the decryption process is equal to the input to the encryption process, where it all began.

It is worth noting the nature of the contracted substitution in Figure 6, which is composed of a set of eight so-called "primitive functions," each with a 6-bit input and a 4-bit output.

These functions are recommended for inclusion in the algorithm, so there's an implication the user can choose his own primitive functions or his own contracted substitution if he wishes.

This contrasts with the practice (in the proposed standard) of dictating all of the other bit manipulation functions, without any hint of freedom of choice for the user.

ACM Plans Rematch

NEW YORK – The election of a regional council member in the Association for Computing Machinery's (ACM) East Central area will be rerun because of voting irregularities, the ACM announced.

Marshall Yovits will square off against Orrin Taulbee in the race.

It was originally announced that Yovits won the post [CW, May 24].

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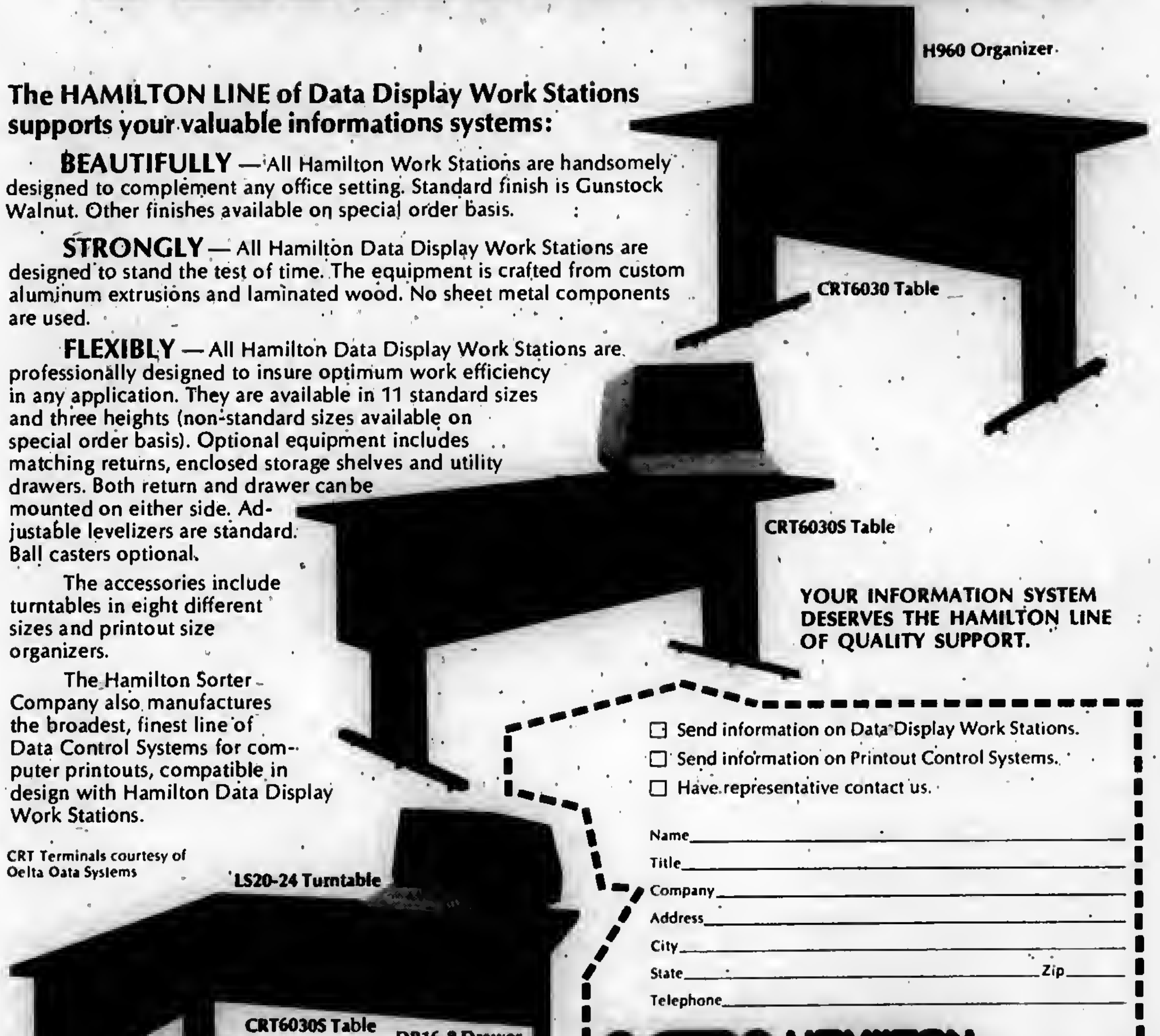

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Information Needs of Voluntary Agencies Changed

By Catherine Arnst
Of the CW Staff

CHICAGO – Voluntary human services agencies are faced "with a whole different ball game" than that of three years ago in terms of what kind of information is needed to function, Earl W. Fischer, executive director of Service Information Systems (SIS), said here recently.

Spotlight On Social Systems

Voluntary agencies today require greater accountability to the public; "it's no longer enough to be a good cause," he added.

Many agencies have found they need an information system, but don't have the capabilities or funds to develop their own. "Agency directors didn't know enough about DP" to know in which direction to go in acquiring a DP system, he continued.

SIS was formed three years ago by four Lutheran agencies to provide DP services for nonprofit social service agencies that found themselves in the situation of needing an information system, but not knowing how to get it, Fischer said.

It currently serves 25 agencies which range in size from annual budgets of $300,000 to $8 million. What SIS has learned is that "things that work for a $500,000 agency don't necessarily work for a $2 million agency," he said.

SIS modeled its system after the standards set by the American Institute of Certified Public Accountants and tried to develop flexible systems that would permit design to fit the individual agency needs. Designing one rigid system "may have been easier, but I also believe it would have been a mistake. It is quite impractical to try to fit agencies into a single mold," Fischer said.

'More Than Payroll'

The systems developed by SIS are geared to social services agencies and try to be "more than just a payroll package," he said. Instead, management information that is not usually gathered by hand is emphasized.

"We have deliberately avoided designing the systems to meet specific external reports," Fischer said. The systems are geared toward internal management needs, the theory being that if internal management needs can be satisfied, the needs for external reporting can be met even though the data may have to be extracted from several pages of printout, he added.

A Different Question

To determine the type of system required by an agency, SIS first asks it: "What do you want to know?" Fischer said. "Interestingly, this is often difficult for the agency staff to answer."

Once the data needs are determined, "we have found it is important to keep it simple. There is a wide degree of sophistication among agencies," and it is more important to design for the unsophisticated than vice versa, he said.

One problem SIS has encountered with the agencies it services is that "because of the flexibility of the systems, agencies tend to use the computer to do everything without examining the cost of that philosophy," Fischer said.

Lack of Understanding

There is also "a basic lack of understanding on the part of the agency's management of the purpose of data and information," he said.

"I have had agency administrators ask for printout format designed so they can simply hand it to the board without having to do anything with it. Or, they ask, why can't the printout be designed so we can send a copy directly to the funding body? There is no recognition of the need for management to study the data to determine what it means," Fischer said.

A second problem occurs when the administrator decides to make use of the system, but the bookkeeper "is convinced the computer won't work. When that situation exists, the computer doesn't work," he said.

On a more positive side, SIS provides social services agencies with management information at a lower cost than if the agency added the staff to produce that information by hand, Fischer said.

SIS also acts in a management capacity for agencies in helping them develop the kinds of information they need, he said. "Our goal is to aid the agency in providing more and better service for people in need," he concluded.

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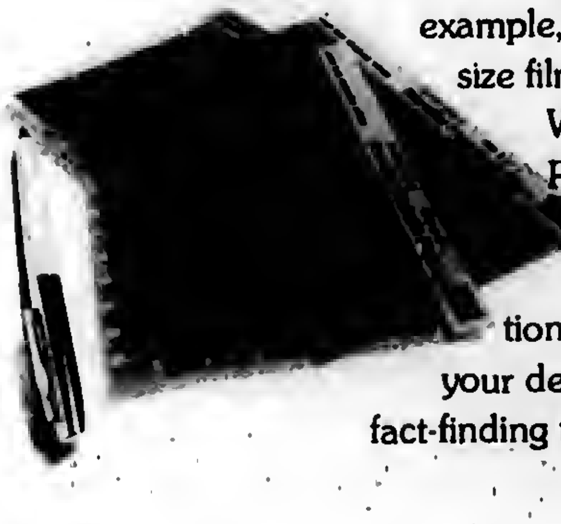

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Private Agency Funds Prototype System To Keep Inventory on 'Lost Children'

By Catherine Arnst
Of the CW Staff

NEW YORK – The lack of a good management information system (MIS) in child welfare has resulted in "children falling through the cracks in the system." They are lost because no one knows whose responsibility they are, what programs they are in, what services they need or even if they exist.

Spotlight On Social Systems

These assertions have been made by several people in the child welfare field, including Peter Forsythe, vice-president of the Edna McConnell Clark Foundation here. The foundation is funding the Child and Youth Center Information System (Cycis), a national prototype of a child welfare system.

"Every state has some sort of public- and private-sector handling of children; these sectors should work together to integrate approaches because they are dealing with the same children.

"Where those sectors are separate at present, you can't even count how many children arc in the system or keep track of services provided," Forsythe said.

One case of losing track that he cited was in Massachusetts, where an independent study showed 30% of the children in the state's care have no caseworkers assigned to them.

The high turnover of caseworkers is another reason why children get lost in the system, Forsythe said. He cited the turnover rate of the average worker in child welfare as 18 months, whereas the turnover rate of the average child is four to five years.

Inventory System Needed

"What the field needs is an inventory system, and it doesn't have one. To delay having one any longer with the technological capabilities available is inexcusable," Forsythe said.

Developing an "inventory" system for children is not a simple task. Besides trying to deal with the jurisdictional problems of including both private and public agencies, a common terminology must be developed that both sectors can be comfortable with; the information must have stringent privacy protections so a child will not be marked by subjective or outdated information, Forsythe said.

Some effective "inventory" systems have been developed that deal with children in both the public and private sectors. Here in New York City, a privately developed and administered system handles foster and adoptive children; in Michigan, a state-run system encompasses children in the juvenile justice system in addition to those out of their homes (see stores on Page 12).

Both of these are part of the first generation in child welfare systems; Cycis is meant as the second generation, Forsythe said.

Cycis was modeled after Michigan's system in that it focuses on all children either out of their own homes or where a court or state has intervened. It is funded privately as an effort to come up with a detailed framework of specific design for a child welfare system that could be adapted by any state, Forsythe said.

The effort was aimed at designing something that was not hardware- or software-based but did contain certain common data element standards and a compatible core of information, he said.

Completed in the spring of 1975 and designed to be implemented in several states last summer, the plan was aborted, however, because of political complications, Forsythe said.

"Interest is still very much alive, though, and we are on the verge of reviving the original deal," he said. If this works out, a consortium of 18 states would start to adapt the system and it would take a minimum of 18 months to implement and that's "if everything goes well," Forsythe said.

Focuses on Workers

Cycis was designed to focus on the worker responsible for a child; the reports and information generated will be available to both management and field workers so performance can be monitored.

Information will only have to be entered into the system once, Forsythe said. "It absolutely has to eliminate a great deal of paperwork. It will fail unless it does," he said.

"Much of the diversity and duplication existing now in the child welfare area is unnecessary, counterproductive and the result of isolation. We are trying to encourage elimination of confusion.

"But unless you have a multidisciplinary approach, the system won't work," he said.

An important aspect of a prototype system is that it be flexible enough to deal with all the vagaries and contradictions of terms existing between the jurisdictional and geographical sectors, Forsythe said. If a rigid set of standards is developed and everyone is then told they must use it, "enormous political and some practical problems are created," he said.

"We are talking about a modest system that is fairly simple so social services people won't be afraid of it. It can't be designed by systems people and imposed on services people," Forsythe said.

Hopefully, what a national standard for child welfare systems will do is bring objectivity and accountability, he said.

"We are working under the assumption the state has already intervened in the child's life when a name is in the system. That child must be sure that intervention is appropriate," he said.

With Cycis, Forsythe predicted that not only will there be a check that intervention is appropriate, but that the proper type of intervention is performed and the child is not doomed to remain in the state's care forever.

The Cycis system was designed to help children whose lives have already interfaced with the system; the idea of building a system that can find a child and possibly help it before intervention is "a scary thing," Forsythe said.

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System Handles All Children in Michigan's Jurisdiction

By Catherine Arnst
Of the CW Staff

Spotlight On Social Systems

LANSING, Mich. – A system has been developed that handles all children under this state's jurisdiction, including foster children, those available for adoption, those in the juvenile justice system and any child who is still living at home but where the state has intervened.

There are approximately 36,000 children in the Child Care and Placement Information System (CCPIS), which has changed the focus of reporting in the state in child welfare.

Prior to CCPIS, each case within each agency was counted; now "kids are counted," according to Beth Lott, control unit supervisor of CCPIS.

"The basic philosophy of CCPIS is that it is a tracking system. The criteria are who's got the body and how long it takes for a child to go through a program," she said.

CCPIS was started in April 1972 and then redesigned; the second version has been up since December 1973. Three sectors are included – the state Department of Social Services (DSS), juvenile courts and private agencies; data is input from 83 courts, 83 regional DSS offices and 97 private agencies.

In Michigan, the problems with CCPIS emerged from dealing with the different agencies involved. When the system was implemented, there was no mandate requiring everyone to work with it, Lott said.

"There was no one head of the whole thing. In the juvenile justice sector, cooperation depends on what the individual judge says; some private agencies didn't want to be involved at all.

"In the beginning there was much resistance. We have just begun to overcome that resistance in the last six months. The turnabout resulted when the workers realized the system worked. Then they were willing to accept it," she said.

Now the biggest problem is "somehow convincing social workers to do their paper work precisely. Improperly recorded data creates a lot of problems," Lott said.

With CCPIS, there is a single data base for all three sectors and each piece of information on each child is input only once.

The personal information contained in the data base is limited to either an identifying or legal nature. Any other possible subjective or harmful information on a child's personal life is prohibited, Lott said.

N.Y. Program Backs Private, Public Sectors

NEW YORK – A privately administered automated child welfare system dealing with foster and adoptive children in both the public and private sectors has been in operation here for three and a half years, and there is currently a bill before the New York State Legislature which would make it a statewide system.

The Child Welfare Information System (CWIS) was started by a group representing public and private agencies, according to Michael R. Diem, coordinator of systems development for CWIS.

There are 28,000 foster children in New York City, which is 15% of the total number in the country, he noted.

CWIS was formed as a nonprofit corporation which now operates on a contractual basis with both the public and private sectors. "The strength of CWIS is that it blends and responds to both public and private needs," Diem said.

The people who must work with CWIS, however, often feel they don't need it at all, he added. "The biggest problem is the fears of the human services community with having a data bank. They fear a child would be permanently labeled by a computerized system," he said.

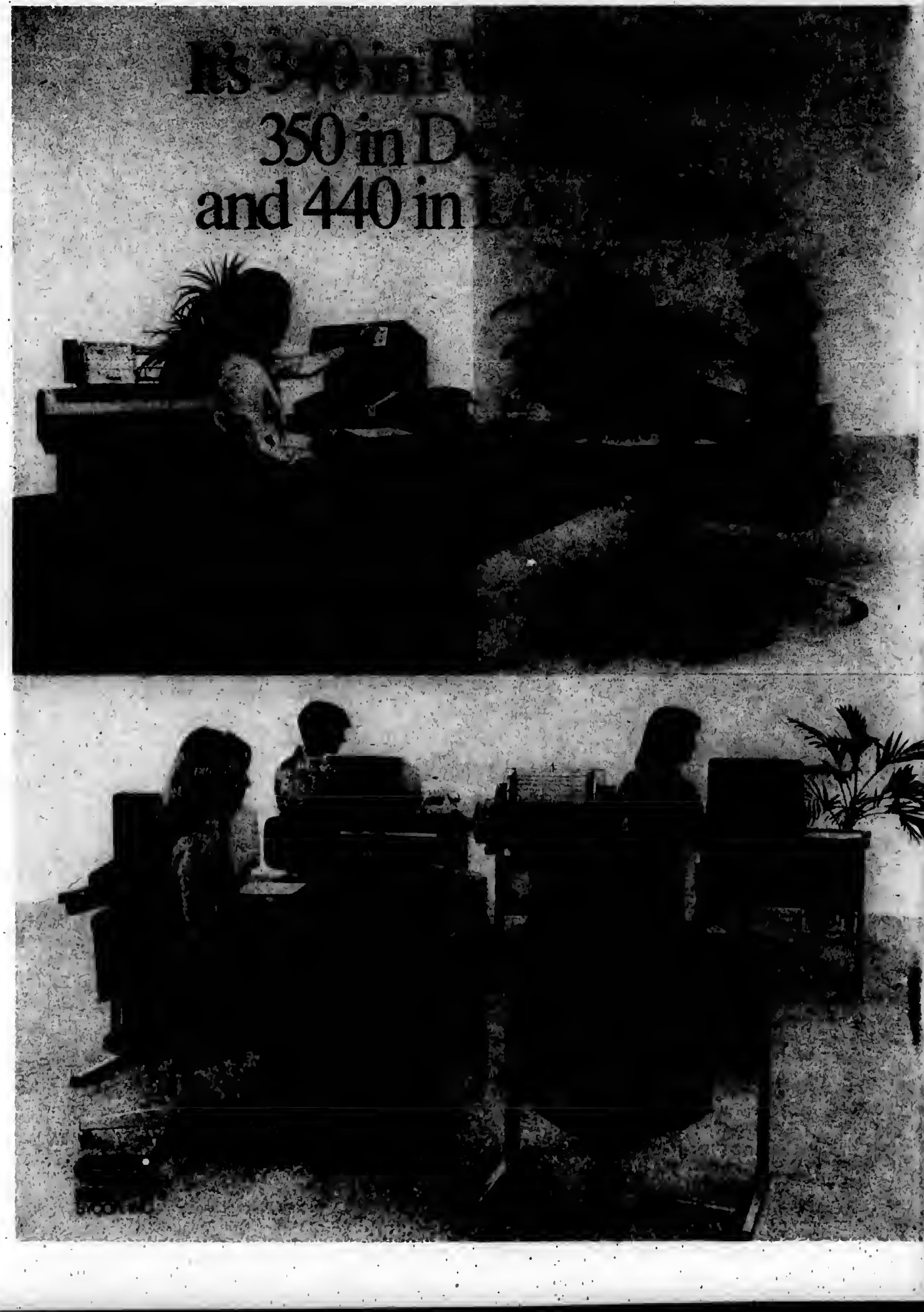
Records are purged once a child leaves the system and there are hardware and software controls for access, but these controls are minimal, he admitted.

Still, the people working with the system often won't participate in a positive way and they can "easily screw up the software by disrecording information," he said.

To overcome the resistance, "you must be sure you have one-to-one contact with the people using the system. They must understand computer concepts, or you are doomed to failure."

And CWIS has found some lost children. One example is when the data on 150 children who needed to be adopted but weren't in the adoption files was recovered with CWIS. "Those children now have a chance for a permanent home," Diem said.

Finding a permanent home for children is the intent of CWIS. "Child welfare can be a trap – once you're in it, it's hard to get out," he said. CWIS is meant to be a tool with which to either return children to their own home or find a permanent home.



Division Marks Entire Industry

Afips Membership Split on Copyrighting Software

By Toni Wiseman
Of the CW Staff

Spotlight On Copyrights

WASHINGTON, D.C. – If the opinions of various associations within the computer industry are somewhat divided on the question of whether software should be copyrighted, so are the opinions of members within a single association.

Three groups representing the American Federation of Information Processing Societies, Inc. (Afips) – the Data Processing Management Association (DPMA), the IEEE Computer Society (IEEE/CS) and the Association for Computing Machinery (ACM) – responded to questions raised by the National Commission on New Technological Uses of Copyrighted Works (Contu).

Speaking on behalf of ACM, Herbert S. Bright commented the essence of the difference in position between segments of the membership is that "some feel complete freedom of information transfer and knowledge usage is in the public interest, while others feel encouragement of product development by protection of investment in programs, making feasible low-priced licensed usage of broad-applicability programs, is similarly in the public interest."

Contrary to the majority of opinions expressed to Contu, Bright stated that "the making and distributing of copies [of programs] does not entail a significant part of the protection problem, which irrespective of one's opinion on desirability of any protection is economically important as, and only as, it relates to execution of a protected program."

While noting that present law may be unenforceable, Bright said some feel that protecting a specific implementation, when invention is not involved, could be accomplished through specificity of new laws without undue restriction on use of generally known ideas.

DPMA Against Patents

William J. Moser, on behalf of the DPMA, was much more forceful in his opinions, stating the DPMA believes programs should definitely be copyrightable – but not patentable.

"However," he added, "there is a question in the minds of many of our members as to the desirability of allowing patents on the structure of overall systems."

On the basis of a number of interviews with a cross-section of DPMA members, Moser said the type of protection afforded software should not vary according to the program.

In addition, DPMA members feel copyright protection should be extended to the right to make or vend copies and there must be a major difference between a purported copy and the original program in order to exclude that copy from infringement.

"Major difference" was defined as not more than (approximately) 50% of the steps of the original program in their original sequence.

"With regard to the right to use, [DPMA's] response depends on the definition of 'use,'" Moser said.

"If 'use' means the execution of a program obtained not by copying, but by some other means (e.g., theft of an existing copy), then copyright protection should make such use illegal.

"If, however, 'use' is defined as writing a similar program (or a substantially different program) to make a computer achieve the same result as it would in execution of the copyrighted program, such use should not be illegal."

The IEEE/CS presentation to Contu dwell at length on the question of definitions of software, particularly in relation to firmware and integrated logic circuitry.

The first problem, the IEEE/CS brief noted, is whether to define a program as an instruction listing, an algorithm, an executive program, a complete operating system, a turnkey system or a full computer/telecommunications system.

"Furthermore, the question of the ownership of the information in the file or in the program, as contrasted with ownership of the physical record of that information, must be addressed," according to Dr. Nathaniel Macon and Herbert Koller, representing the society.

They contended the specific form of protection, be it copyright, trade secret, patent, contract or some new legal entity, must depend on the type of program regarded not by its economic value or its complexity but on other factors.

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Cbema Backs Passage

Bills Would Make Programs 'Properly Copyrightable'

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – "Computer programs are currently copyrightable and . . . they will be properly copyrightable under the terms of S. 22 and H.R. 2223.

Spotlight On Copyrights

"Not only that, [the Computer and Business Equipment Manufacturers Association (Cbema)] believes computer programs should be explicitly declared [subject to]. copyright [which is] particularly apropos as a protection mechanism for computer programs because programming involves the writing of an author and because the primary exposure for the proprietor is the case of copying by others."

Thus Peter F. McCloskey, president of Cbema, summed up that body's position on the applicability of copyright protection to computer software before the National Commission on New Technological Uses for Copyrighted Works.

S. 22 and H.R. 2223 refer to pending copyright law revision legislation in the U.S. Senate and House of Representatives.

Without legal protection, the proprietor of a program is at the mercy of anyone with an office copier or any machine-readable media duplicator, including a computer, he noted.

While Cbema has in two past instances encouraged a definitive judicial decision on the question of program patentability, the area remains unclear since few programs fulfill the novelty and unobviousness requirements of patent laws.

Cbema's position is that computer software should be treated as much like analogous copyrighted works as possible, including that the length of time for copyright protection should be the usual time provided by the copyright law.

McCloskey compared computer programs to musical and dramatic works in terms of copyright coverage since they are "performed."

"Thus we urge that copyright protection of computer software should not be limited to the right to make and vend copies of the program," he said.

"A single copy, once sold, can pass through many hands, and some means must be provided for preventing it from being effectively copied by each holder through being input into his computer where an executable copy would continue to reside after the original program copy is passed on," McCloskey said.

Legislation should provide that the inputting of a program into a computer constitutes copying, which requires authorization by the proprietor, he said.

"Thus, copyright protection should include the exclusive right to make copies by recording within a computer. There would be no objection to the right extending further to the use of a program to operate a computer in a manner similar to the performance right in the musical or dramatic work," he said.

Since copying is a key issue in the proposed legislation, Cbema has proposed an amendment to Section 106, which outlines the exclusive rights of the copyright owner.

The amendment would read: "In the case of a data base and computer program works, to read into, to store or reproduce for storage the work in automatic systems capable of storing, processing, retrieving or transferring information or any similar device, machine or process" would be the rights of the copyright owner.

This amendment would cover recording onto machine-readable media as by keypunching cards, duplicating machine-readable media such as punched cards or magnetic tapes, inputting a program into a computer from human or machine-readable media or inputting a program into computer memory for execution.

Existing Protection Under Patent Laws Seen as Inadequate

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – Patent protection is available for software products under existing law, and further protection is available under state trade secret laws, according to Carol A. Cohen, general counsel for Applied Data Research, Inc. (ADR).

However, while trade secret, patent or restricted contract protection is sufficient for some firms, "those who develop [software programs] at tremendous cost do need the protection afforded by copyrighting," she said.

Protection, no matter what the form, is needed because of the ease of reproduction, she said.

In addition, the software industry is a developing industry with many small businesses who cannot and will not be able to afford the tremendous investment necessary to develop software packages unless they are assured of complete proprietary protection.

The value of trade secret protection relates to the size of the market, and continuing and conscientious efforts to maintain secrecy become difficult when the proprietary product is being disseminated over a large market. This is particularly true when the product is being disseminated in foreign countries.

While ADR was the first in the industry to obtain a patent on a software product (Autoflow), and the company continues to copyright all its proprietary products, Cohen said she would still like to see modifications in the copyright law to further clarify and deal with protection of software programs.

Specifically, she believes a whole new class should be developed relative to computer software.

"I believe there should be specific inclusion of the definition of the form in which this writing can occur," Cohen said.

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Better Program Protection Needed to Avoid Waste

By Toni Wiseman
Of the CW Staff

Spotlight On Copyrights

WASHINGTON, D.C. – Without better methods of program protection and broader means of public disclosure, "we are bound to waste our resources, chance the stifling of software productivity in the future and forever 'reinvent the wheel,' " according to the Computer Industry Association (CIA) and others testifying before the National Commission on New Technological Uses of Copyrighted Works.

Speaking on behalf of the association, CIA President A.G.W. Biddle could not offer a "best solution," listing rather the pros and cons of trade secrets, patents and copyrights.

"To the large data management system supplier whose main concern is to minimize the risk of loss, trade secret protection is the only feasible means currently available," he said.

"Still other manufacturers favor patents to protect their software products. In short, we have discovered there is no consensus in the industry."

Patent laws, protect the invention or discovery of an idea by giving its creator a legal monopoly over its use, while copyright laws do not protect an author's idea, but only the author's embodiment of that idea, Biddle said.

This means that, with software, copyrighting offers a very limited means of protection since competitors need only reembody another's ideas in some other noncopyrighted program, he said.

Patent protection, on the other hand, would give the greatest security on a software product since it would protect the creator's idea regardless of the form in which it might become embodied, he said.

Patent laws, however, provide only an incomplete answer to the question of software protection, Biddle noted.

Many inventions, for example, cannot satisfy the requirement of nonobviousness as a standard of patentability. In addition, there is the problem of how to effectively search the prior art if software patents become a reality, he said.

"Additionally, the delays between filing and the ultimate issuance of a patent, typically about three years, overlap the useful life of many innovations," Biddle said.

Must Broaden Concept

Copyrighting is not the ideal answer either. "The copyright laws must be madc more responsive to the technology of computers and information processing if they are to benefit the software suppliers.

"The concept of copying must be broadened to include not just the actual reproduction of a computer program, but its transformation into magnetic or electronically coded storage as well," Biddle said.

Additionally, the translation of a program into a different computer language should constitute a copying for the purposes of copyright infringement. And perhaps even any transformation between diagrams or flowcharts and the program text or vice versa should constitute copying under the copyright law, he said.

"There has been a favorable response from some of our members to the notion that a new registration program akin to the copyright system should be devised specifically for software products, Biddle said.

"Under such a system, it is suggestcd that only software programming concepts and not the actual coding be disclosed. Registration should only be permitted if these concepts represent a sufficiently complex process to warrant protection based on originality," he noted.

Under this scheme, a panel of experts would make the final dctermination before authorizing registration as well as acting in subsequent infringement suits.

Biddle noted several points against copyrighting software, including the fact that much systems software is created by the hardware manufacturer and is price bundled. Many of these programs will work only with a particular machine, thereby diminishing the probability that a copier can sell his "illcgally obtained merchandise" at a profit.

Also, since many of today's application programs are written in-house to suit individual needs, the software is of such a specialized nature that copies would have little significant marketing potential.

"Those application packages which are not tailored to a specific user's needs, but rather are marketed as general-purpose programs come with documentation, manuals, warrantics and services," Biddle said. "The cost of these supporting items may equal or excecd thc program's initial cost.

"These facts suggest that a uscr is oftcn buying services and expertisc as much as the particular programs themselves. Thus, the ill-gotten gains that may accrue to a copying seller who is unable to provide the concomitant scrvices and expertise will be minimal," he said.

Copyright Cost a Problem

Administrative considerations such as the "transaction cost" problems for producers who copyright nearly all their creations are points against copyrights, too.

"Almost all of the association member companies agree that trade secrets offer the most reasonable means of product protection," he said.

"The real advantage which trade secreted software has over copyrighted software is that, because there is less access to the product, there is less opportunity to steal and, hence, the problems connected with detection of unauthorized use are thereby reduced."

But here again problems arise such as what constitutes adequate protection of secrets from disclosures and, because of the diversity in hardware systems and the size of the potential user market, it can often be uneconomical to meet these standards of protection, he said.

"Several suggestions have been made that if these problems could be solved, perhaps through federal legislation, there would be little need to pursue the copyright solution any further," he said.

Biddle suggested that encryption might be a solution to many of the problems, since the use of a standard encryption technique would constitute prima facie evidence that a supplier had adequately protected his trade secret.

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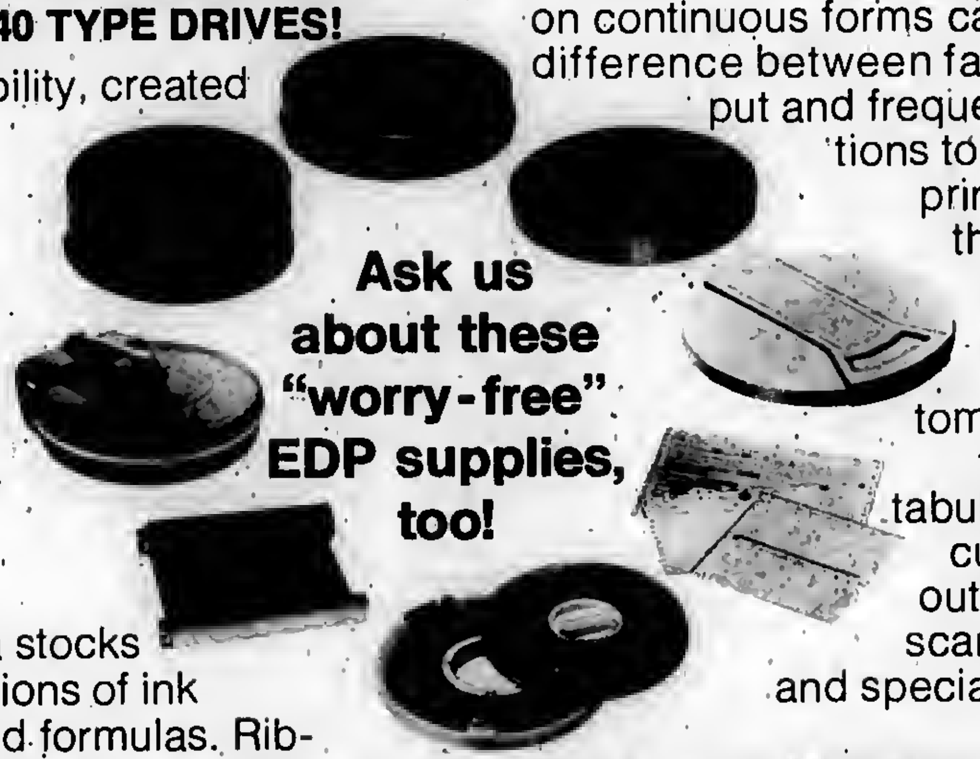

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It Made All the Difference

NEW YORK – All the computers in Armonk won't produce the right answer if the mathematical model being processed is based on wrong assumptions.

That's the lesson TV news executives and a host of newspapers learned after they named Morris K. Udall rather than Jimmy Carter winner of the Wisconsin primary election.

Richard Scammon, a consultant for NBC-TV news here, told "Today Show" viewers the next morning that NBC had made its projection on the returns from 100 key precincts without considering the extent of Carter support in areas where votes were cast on paper ballots.

Paper ballots must be counted by hand and thus were the last to be reported.

TV network executives called the goof a "human error," pointing out that, regardless of technology, the final decision when naming a winner is still based on human judgment.

ABC-TV was the first to call Udall the victor, interrupting its program "The Rookies" at 9:27 p.m. to do so.

NBC made no announcement until 10:22 p.m., but at that time it also predicted Udall the winner "by a modest margin."

Despite pressure to keep up with the competition, CBS-TV refused to make any prediction until 2:30 a.m., when it declared Carter the winner. By then, East Coast TV affiliates had shut down for the night and only West Coast viewers got the news.

CBS, which received data from sample precincts throughout Wisconsin and entered it into its computer much like NBC did in New Hampshire [CW, March 1], saw a very narrow Carter margin all evening, but it was not large enough to be "reliable," a spokesman said.

However, the early vote results came from Milwaukee, Madison and their suburbs, where more up-to-date voting systems were employed.

The farm vote made the difference.

Service Gathers Tallies For Major News Media

By Nancy French
Of the CW Staff

NEW YORK – No national news organization can broadcast or print election results without having some way of gathering tallies almost as soon as the polls are closed.

Spotlight On Election Systems

Rather than gathering the results individually, the three major television/radio networks and two wire services pooled their resources and established the News Election Service (NES).

NES services the American Broadcasting Co. (ABC); Columbia Broadcasting System (CBS); the National Broadcasting Co. (NBC); Associated Press (AP) and United Press International (UPI).

The service has developed a complete network of people and equipment to receive precinct totals, keypunch the data, tabulate it and then disseminate it to its five member organizations. Members then disseminate that information still further.

Although NES employs only about 12 people year-round, on election night its ranks swell to nearly 9,000 employees and 10,000 volunteers, according to Dick Eimers, NES executive director.

In exchange for a contribution, civic groups (such as the Jaycees), church groups, teachers' associations and business and professional organizations provide volunteers to report election results at the precinct level as those tallies become available.

In a national election in which all 50 states must be covered, paid reporters are assigned to phone in results from about 100,000 polling places, Eimers said.

A second team reports tallies from election board tabulation centers in major cities and counties to give NES a check against the figures reported by the first team, he added.

Six NES "collection centers" – one each in Chicago, Cincinnati, Dallas and Baltimore and two in New York – are staffed by about 3,000 NES employees who put telephone reports on paper for keypunch operators.

After keypunching on IBM 029 and 129 keypunch equipment, the data is transmitted via IBM card transceivers to the computer center in New York.

Data is received by IBM 3704 communications front ends and processed on dual IBM 370/155s; totals are turned around and output to the five members' own computers.

Most members receive that data on Teletype Model 40s.

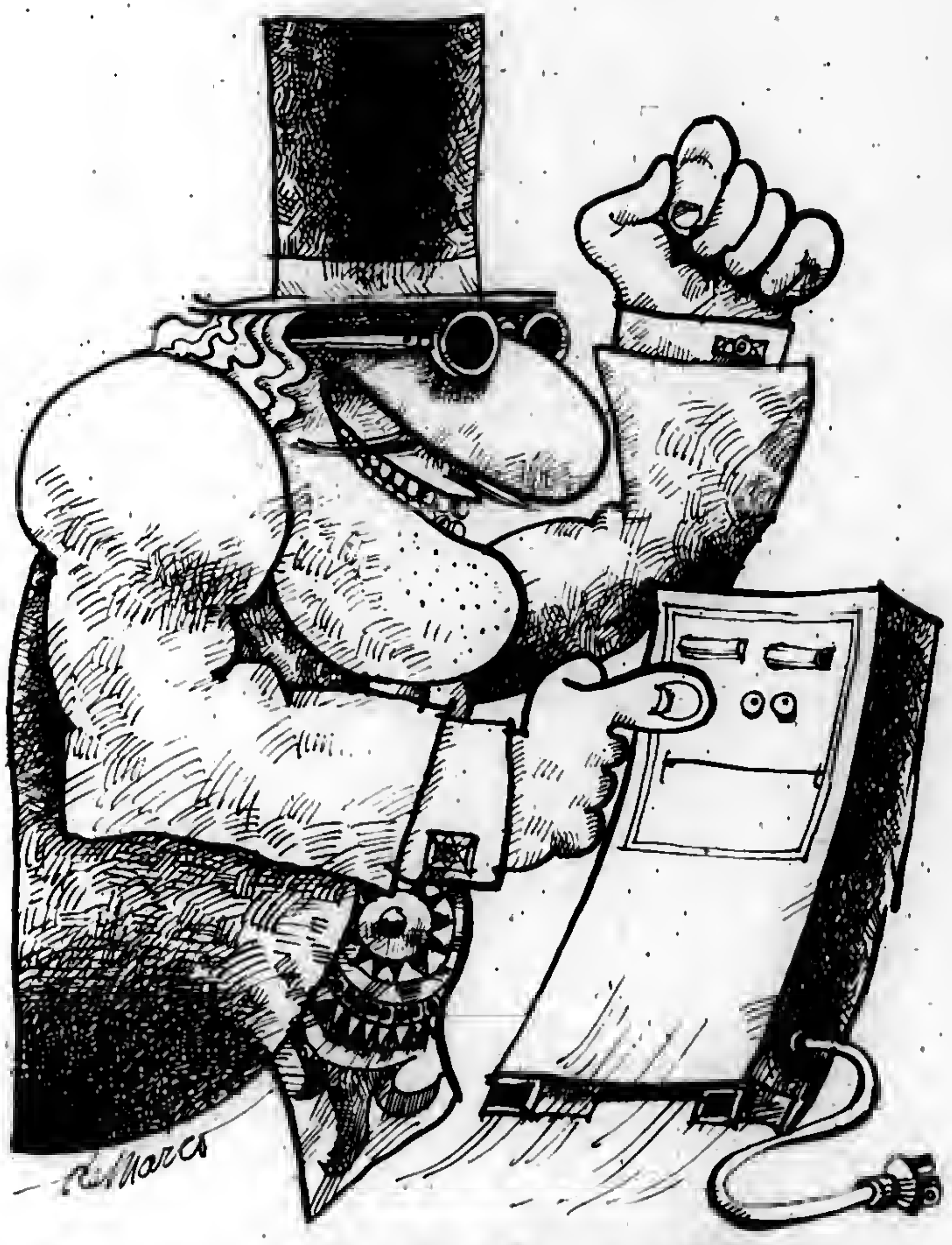
NES provides its members a new presidential report every 60 sec and new county totals for every county in the nation every 15 min. State totals for President, senator and governor are updated every minute and the results of the 435 congressional races are updated every 10 min.

First Line of Defense

The dual-processor system is NES' first line of defense against system failure, according to Eimers. If the system should fail, NES staffers are prepared to go to a manual system.

"We provide only the hard factual totals – all projections and analysis is left to the members," Eimers noted, adding that vote counting continues until all elections are decided, which is usually the following night.

The numbers provided by NES are all unofficial totals, and members usually replace them with official totals when they become available for archival purposes, he said.



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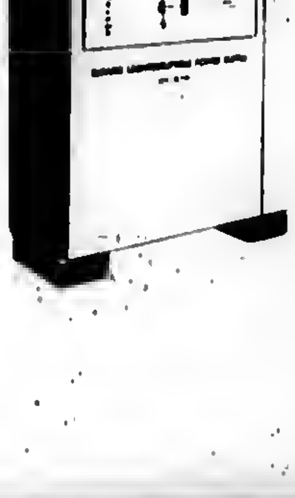

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County Writes Own System to Handle 750 Candidates

By Nancy French
Of the CW Staff

PHOENIX – Conducting an election where voters will consider 750 candidates ranging from President of the U.S. to justice of the peace involves far more than counting the ballots.

Spotlight On Election Systems

That's why Maricopa County officials here wrote their own election system software this year to replace the Computer Election System (CES) package used in previous years, according to Michael S. Griffin, director of the county's Information Systems and Services Department.

CES programs used in the past were more than satisfactory, Griffin said, but they were originally designed for IBM systems and later generalized for use on all the major manufacturers' systems. They are therefore somewhat less efficient than programs written for the county's Honeywell H6000 gear, he said. "What's more, we don't have to call California and have [CES] call a patch card back to us when something doesn't work just right," he said. "Our people here can do all the work."

The election system is comprised of four phases: The first is data entry, which involves helping the Board of Elections build a data base of candidates who have filed.

The second phase involves printing the 12-page ballots used by each voter. Phase three is ballot counting, and phase four is postelection reporting.

Of the four, the first two phases require the most complex and time-consuming computer programs, according to Herb Carney, who, as the department's Techniques Manager, heads the election unit.

Candidates have been registering in person at the Elections Department office, where the necessary transaction forms are filled out. This data is entered daily into the computer, where it is stored temporarily on three indexed sequential processing files.

After the candidate filing period closes in mid-July, the DP department will begin to validate the data base. When all candidates are finalized, the final data base will be built and sample ballots and candidate mailing labels will be printed.

Each candidate will be mailed a sample ballot to assure his name, or whatever nickname he chooses to use, are spelled correctly, Carney said.

Candidate Rotation

When the samples are returned, the data base will be corrected and candidate rotation performed, Carney said.

"By law, every candidate running for office has to appear in every position on the ballot in an equal number of precincts," he explained. This gives each an equal chance at the voter who doesn't know the candidates and merely votes for the name at the top of the list.

The rotation function also builds ballot records keyed by precinct number.

Next, programs will be run to determine how many unique types of pages – actually 80-column cards – must be printed and assembled into the ballot booklets and what formats each page will have.

These page reports will then be delivered to the printing contractors along with exact quantity specifications for each page to be printed and instructions for ballot booklet assembly.

On election day, voters will cast their ballots by punching out perforated holes in the voting booklets.

At 7 p.m., when the polls close, precinct workers from the Board of Elections will account for every ballot, including damaged ones, and deliver the ballots in sealed metal boxes to a receiving station where the contents will be inspected and precincts logged in.

Back at the DP Department . . .

When the cards are received at the DP department they will be stacked, separated by precinct using a diagnostic card and then placed in trays for reading by Documentation Model 1000L card readers.

As long as the diagnostic card at the end of each precinct reads correctly, operators will know the reader is working perfectly, Carney explained. If trouble is spotted, reading will be stopped.

Data will be multiplex onto magnetic tape by two 8K Digital Control Corp. Model 116 minicomputers. Tapes, each containing about 6,000 ballots, will be unloaded at 10-minute intervals.

The H6000 will read in data, sort it by precinct and put totals out on disk.

When key precincts come up, the DP department will output key precinct reports used by the news media to predict the probably outcome of the election, Carney said.

The reading, writing onto tape and processing of the 10-minute reels will be repeated over and over until all the ballots are tabulated.

Tape backup will also be used for extra security.

With approximately 525,000 ballots to count from 502 precincts, the automated tabulating system will move far faster than the election officials who have to deliver the ballots from outlying precincts, Carney said.

Despite this problem, DP officials have ruled out use of remote data entry techniques for reliability and security reasons. As an additional safeguard, the H6000 used to process the votes has no communications access.

Within 48 hours, absentee ballots as well as those cast by voters who were mistakenly left off the registration list will be processed and the final tallies printed out.

Although the new software has yet to be used in a national election, DP staff members have "run more test data through the system than we expect to get election night," Carney said.

The first test in an official countywide election will come in September's primary election.

The county spent $140,000 to develop its election systems software, including both machine time and programmer hours, Griffin said, noting it would have cost $177,000 to purchase the CES package. That package also rents for about $27,500/year for a county of Maricopa's size.

The multiplexing preprocessing system, along with the Votomatics, were purchased from CES.

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DP Works Behind the Scenes at Firms Conducting Public Opinion Surveys

By John P. Hebert
Of the CW Staff

While presidential candidates are holding center stage this year, the organizations which chart public opinion are also in the limelight as they attempt to label the factors responsible for each candidate's projected vote-getting in a certain primary.

Spotlight On Election Systems

And behind the scenes at these public opinion polling outfits, the computer is no stranger. It is one of the constants – a research tool involved in determining the results of every survey.

These systems have a meticulously controlled fairly steady input of figures, sifted from answers to both simple and complex questions posed to selected segments of the population.

One thing in common at two of the three organizations contacted to find out how computers are used for their polling purposes was that the people who deal with computers came into their present capacity from the market research side of the fence, rather than from the DP side, Jim Cleak, DP manager at the New York firm of Daniel Yankelovitch, Inc. said.

"The [polling] industry's use of computers is very unique and the needs are unique," Cleak explained.

This brand of approach to computer-based processing of poll results was reflected by the staff at the first such polling firm established, The Gallup Organization.

Employees there who deal directly with the computer end of the business include one full-time and one part-time operator, four keypunch operators, three specifications writers and Steve Oberheim, who is director of systems and operations.

At the Manhattan, N.Y., firm of Louis Harris and Associates, Inc., no computer processing is done in-house presently, according to David Neft, chief statistician for the survey firm.

At all three organizations, it is not surprising that public opinion polling of political issues is not the companies' mainstay.

Rather, commercial applications aimed toward market research are the staple workload for the pollsters' computers.

For each Gallup Poll (a term which became a household word about 10 years after the firm's founding by George Gallup in 1935) an IBM 1130 computer and related IBM keypunch, card reader, disk drive and chain printer equipment handle 99% of the organization's data processing workload, Gallup said.

The system helps tabulate about two survey releases each week or about 110 releases yearly for 140 or 150 subscriber newspapers, according to the organization's founder.

In the last five months, The Gallup Organization has completed nine or 10 national syndicated political opinion surveys. –

Although there is a problem with more figures and more complex figures when dealing with political opinion analysis – which accounts for only 10% of Gallup's business – the 1130 system handles those in-depth cross-tabulations too, Oberheim said.

Compilation of the survey results typically takes about three hours for cross-tabulations of the data, including data editing, going through verifying punches and weighting of samples. Four to five hours of machine time are then needed for a full-scale run of the data for a "normal" survey, Oberheim said.

These estimates also represent the machine time for a new polling procedure this year involving in-person interviews conducted at 300 sampling spots at local primary elections in each state, he said.

At these sites, voters are asked 100 questions concerning the specific election in which they are participating, he explained.

Question results are sent back to the shop, then coded, keypunched and tabulated in about three hours.

Eve-of-Election Interviews

At the same sampling spots on the eve of the election, Gallup's field staff of about 1,500 interviewers ask 320 people more in-depth questions about the candidates entered in the primary, he said.

The survey's responses are telephone to and tape-recorded at Gallup's New Jersey headquarters, tabulated that Monday and reported in the syndicated newspapers Tuesday, Oberheim explained.

"It is a top-priority, time-dependent situation which has to run immediately" on the computer system, he said.

Asked whether data transmission of results could be a future possibility, Oberheim called the operation "too complex, with too rapid a turnover of interviewers". and cited the problem of training people to perform the information entry.

In September and October of this year, the organization's army of interviewers will migrate to "key election precincts," to help project a winner for the presidential race, Oberheim noted.

Then, the computer system will use the comparative figures to help predict the final election outcome, but in a limited capacity – analysis through "number chunking," he said.

"But people will analyze the results, he said. "I don't know if a computer ever could analyze the results."

At Daniel Yankelovitch, an IBM-compatible mainframe recently replaced the IBM 1130 the firm had used since 1969.

The Computer Hardware, Inc. Model 2130 CPU is used for most of the political opinion survey and consumer-oriented market research studies.

"We do the straight tabulations of all the jobs run, such as cross-tabulations and analysis of key variables." But the heavy statistical jobs which have to be run are sent to a service bureau with a large machine, Cleak added.

The firm develops question strategies as it goes along, in terms of the present presidential primaries, Cleak said.

At Daniel Yankelovitch, a staff dealing with analysis of results uses pretest to determine questions in future polls, and preliminary tabulations are conducted for each survey's results to determine what the staff will look at in depth, although the computer is only an aide in this respect, Cleak explained.

The DP manager said the company has done about four public opinion surveys concerning the presidential primaries since last December, two of which were published during the Florida and Pennsyl-

(Continued on Page 19)

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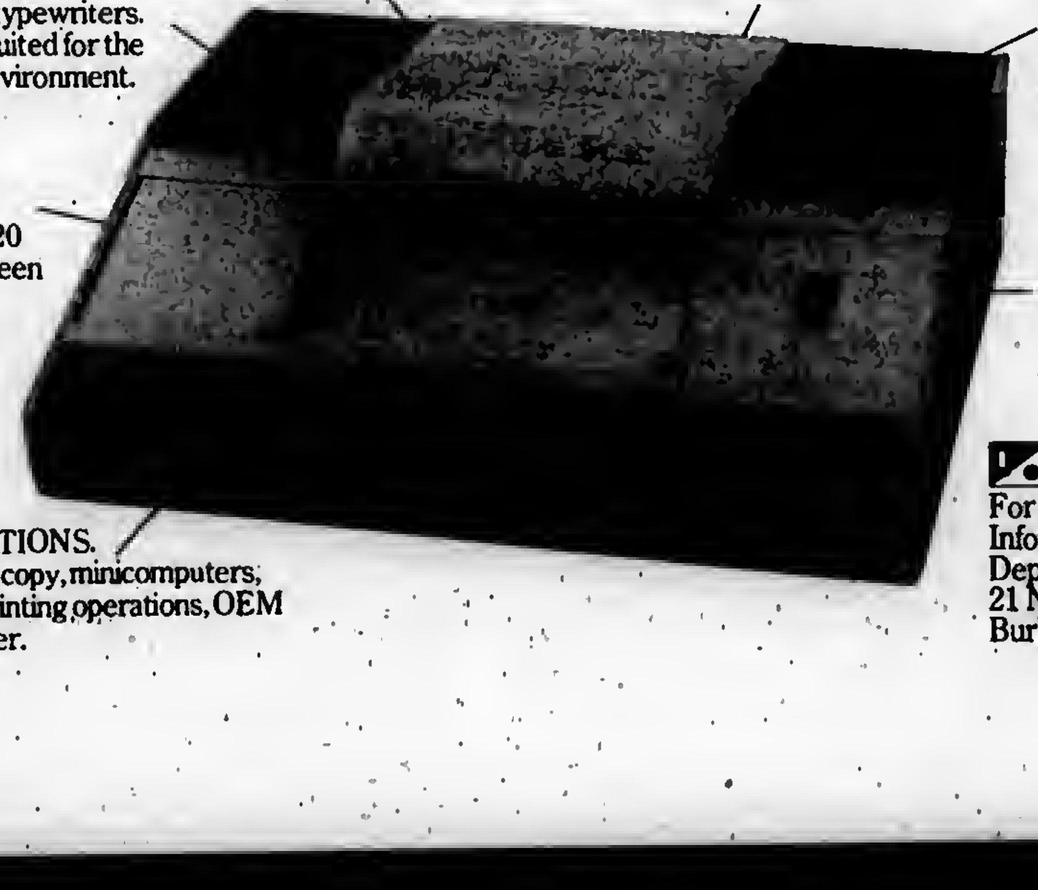

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DP Shares Only Small Portion of Polling Workload

By John P. Hebert
Of the CW Staff

Spotlight On Election Systems

At The Gallup Organization; Louis Harris and Associates, Inc.; and Daniel Yankelovitch, Inc. – organizations which conduct public opinion polling during presidential election years – the computer system is in either a corner of the organization or not there at all.

In a business that is "half art and half science," according to Jim Cleak, DP manager at Daniel Yankelovitch, computers share only a small part of the creative workload.

An IBM 1130 system handles 99% of the cross-tabulations common to analysis of survey results at Gallup, and a Computer Hardware, Inc. Model 2130 running in IBM 1130 emulation accomplishes similar functions at Daniel Yankelovtich.

Harrls does not have its own computer – it uses an IBM 370/145 system on a time-sharing basis from lts former parent firm, Donaldson, Lufkin and Janrett, David Neft, the firm's chief statistician said..

Looking at Word Processing

Harris is "looking toward" word processing though to handle the typical 400 to 500 pages of printouts received from the service bureau after running survey data through the machine, Neft said.

Using word processing would give the organization "the ability to take raw data and quickly, easily and cheaply transform it into a final form" rather than trying to deal with that large bulk of computer-processed data, he said.

This would involve either owning a system or owning the peripheral gear for such a system, Neft explained, adding the company is watching IBM and waiting for the corporation to build a satisfactory word-processing machine before it makes such a move.

Calling it a major step, Neft noted that the Harris organization might go in-house because the "nature of computers is changing and more capabilities can be obtained for less cost."

"We're certainly not afraid of having computers," he said.

The Gallup Organization also might be in line for a new computer in the future, but the time frame for an upgrade from its present system is not known, according to the organization's founder, George Gallup.

The organization's present computer equipment includes the 8K core IBM 1130, centered In a card-oriented shop, Steve Oberhelm, director of systems and operations, noted.

The Gallup shop has additional disk drives, IBM 2315s, each with 512K, 16-bit words, providing 1M bytes of on-line storage, Oberhelm said.

In addition, the firm uses two IBM 129 keypunches, three IBM 029 keypunches and an IBM 024 keypunch which Oberheim said was "very old, but very reliable for multiprocessing" – the handling of multiple responses to questions asked by the firm's nationwide network of 1,500 interviewers.

The problem with converting to a new computer system would be software compatibility with new machines, although it would be nice to have one of these machines which are from five to 10 times faster than the 1130, Oberheim said.

Gallup's DP shop also uses a 1442 punch card reader and an 1132 chain printer, he said.

Since Daniel Yankelovitch, Inc. recently upgraded to the Computer Hardware, Inc. Model 2130 CPU, with 16K characters of storage, it does not have any upgrade plans for the immediate future.

The organization uses the 2130 for most of the straight tabulations of survey results, Jim Cleak, DP manager, said.

The heavy statistical analyses are sent out to a service bureau where another batch operation, based on IBM 370/158 and 360/65 mainframes process the data.

"Key-to-disk is maybe where we should be," Cleak said, adding the firm may go to a large in-house system some day.

Behind the Scenes, Pollsters Using DP

(Continued from Page 18)

vania primaries.

"We try to deal more with the issues because this is the real nuts and bolts of market research, measuring the public's mood in relation to the economy and zeroing in on an election later, especially after key primaries," he said.

Yankelovitch conducts a purely batch operation on the Computer Hardware Model 2130, and the organization now has the ability to cross-tabulate surveys with 500-case samples. "There is no limit to the in-house work with the easy stuff," Cleak explained.

For the political opinion polls, the firm uses anywhere from one to six punch cards for each person, depending upon the length of the interview. When the data is fed into the system, the run time can vary from about two hours for a small study to a maximum of 50 or 60 hours. An IBM 1130 system, which was replaced by the Model 2130, would run a maximum of 300 hours on large in-house surveys, Cleak said.

Contrastingly, Harris rarely runs a political opinion survey all at once through the IBM 370/145 computer system it uses on a time-sharing basis – "it's usually too large a job with too many parameters," Neft said.

Like the other pollsters, Harris surveys typically take about two or three hours of machine time, Neft said.

Similarly, the computer system is only indirectly used in the planning of surveys.

Harris uses the computer mainly for cross-tabulation and also factoral analysis of results in a batch processing environment at the service bureau, according to Neft.

The firm does have its own programmers, Neft noted.

Thus far this year, Harris has conducted 10 or 12 doo-to-door election polls.

After a poll is conducted, results are sent off to the service bureau. Some 400 to 500 pages of reports come back and then the company has to decide which of the huge battery of data should be used in a final report. "it has to be read, proofed and then put into the final form," Neft said.

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Suit Charges Congressmen Use 370 to Abuse Franking

By John P. Hebert
Of the CW Staff

Spotlight on Election Systems

WASHINGTON, D.C. – Congressmen have been using a federally maintained computer to prepare mailing lists for their own political gain in election years, according to Common Cause, the citizens' group.

The group is bringing the Postmaster General and the Secretary of the Treasury to court in a suit which alleges taxpayers' dollars are spent to fund the abuse of the franking privilege.

The suit, Common Cause vs. (Benjamin F.) Bailer and (William E.) Simon, asks the Postmaster General to resume more careful oversight of mail sent under the franking privilege to make sure it is official business, according to a Common Cause attorney who is working on the case.

Source of Evidence Only

"The computer is one source of evidence". in the case, the attorney said.

Particular mailing lists contained in the Senate Computer Service's IBM 370/158 mainframe are in question, but the use of the computer is not an issue itself – it is merely an indicator, the attorney remarked.

Figures released by the U.S. Postal Service appear to support the group's case. About $38 million was spent for mail sent under the franking privilege for all 535 members of the House and Senate in fiscal 1975, according to the figures.

In fiscal 1976, a year of general elections, it was estimated $46 million will be spent for all mail sent by congressmen without personal charge under the rubric "Official Business." That is roughly $85,000 for each official.

Common Cause has been gathering evidence since filing the suit in October 1973 and plans to take the case to federal court sometime this summer, the attorney said.

Largest Batch Operation

Compiling mailing lists is "the largest of the batch-processing functions" for Senate members, according to James Estep, supervisor of applications development for the Senate Computer Service.

This batch-processing function is not a prime-shift operation, Estep explained; the real-time programming functions and access of data base files for tracking Senate floor votes and other legislative and administrative functions is "a much larger operation which is run during the prime shift."

The rules governing the use of the computer are set by the Subcommittee for Rules on Computer Services, according to Estep, who has been subpoenaed "along with every [administrative assistant] in the House" and several others.

No Direct Access

There is no direct access by any legislative officer to the computer system: the Senate Computer Service offers senators no data entry capability, but their office staff can make changes to programs, he said.

"Programs and modifications are available to all, but they must get authorization from the sergeant-at-arms to bring in data from the outside" – which would include mailing lists not already in the computer, Estep noted.

Some applications run on the computer are open to everybody; some are open to the Secretary only. The important thing, Estep emphasized, is that usage is determined by particular application rather than by a "blanket" type of coverage.

Terminals in Offices

Terminals are located in member's offices in the Senate Federal Office Buidling and some are within the Capitol Building itself, but these are used for purposes of information retrieval, he said.

The use of the computer service is monitored "as much as possible," Estep said.

Each senator has a mail specialist – a consultant who specializes in the use of mailing lists for franked mail, the Common Cause attorney said.

According to recent pretrial court testimony, one such mail specialist for several Senate Republicans said one of these franking privilege mailing lists was labled simply "Fat Cats."

Other lists hold information on political donors to future campaigns, potential campaign workers and those who have contributed money to candidates for the opposing party, Joyce P. Baker, the former mail specialist, testified.

Point of Suit

According to the Common Cause attorney, the the point of the lawsuit is to stop the practice of using the computer for these illegal mailing lists in general – there is no particular reason other than that.

Common Cause is not asking for specific congressman's accountability on the issue, the attorney said.

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Feared Blacks, Poor Wouldn't Vote

Test of Punch-Card System Denied in Tenn. County

By John P. Hebert
Of the CW Staff

Spotlight On Election Systems

MEMPHIS, Tenn. – The legislative body which approves expenditures for Shelby County here returned a resounding vote of no confidence recently when asked to fund the test of a computerized election system in the state's May 25 presidential primary.

The request was made by the Shelby County Election Commission Board, which wanted to test the Computer Election Systems, Inc. (CES) Votomatic punch-card voting system in 30 precincts out of the county's 218. The Shelby County Court unanimously turned down the request.

The county court – a quarterly court usually composed of 11 members, but presently composed of 10 – said "no" because it thought the poor and blacks would be disenfranchised due to a fear of the computerized system, according to Ann Weldon, chairwoman of the county's Election Commission Board.

The four black members on the county court were "sold a bill of goods" by the court's white members, Weldon said.

The court based its decision upon an unwillingness to try the CES equipment, she added, noting the court never saw the system.

Aimed at Saving Money

"What we were trying to do, basically, was to save money," Weldon said, but those who must approve the expenditure to test the machines are the "people who don't know about it.

"Everybody [else] we've shown it to thinks it's the easiest thing they've ever seen," she added.

The budget for the elections process in Shelby County each year is over $1 million, a figure which Weldon termed "ridiculous." This year, those costs may rise another 45.3% – a result of "the biggest elections the county has had" and the resulting involvement of personnel to run the elections and storage of the present lever-type machines, she said.

It costs the county about $40,000/year – or about $1/ft – to store the Shupe Co. lever-type machines and will cost another $20,000 for plastic covers this year, Weldon said.

These facts, when combined with the high costs associated with transporting and setting up the 800-lb machines, should have been enough proof to persuade the county court to approve a test of the Votomatics, Weldon indicated.

About 25 Votomatic machines can be stored in the space required by one lever-type device, she noted.

Resistance of Blacks

The reason why the county court voted against the use of the Votomatics in the presidential primary elections, according to Charles Perkins, chairman and member of the Shelby County Court, was because of a "resistance among the black squires" – members of the court.

The blacks think the black community will not accept the computerized system because of many things, he said.

Among these are a feeling that it is an untried system and the security is not as good as with the lever-type machines; that using the punch-card system carries the danger of cards being able to be repunched after the voter has cast a ballot; and the fact that the CES system is "not really sturdy looking – it's really fragile," the court chairman said.

As a result of the vote by the county court, the test of the CES machines has been deferred indefinitely, he said.

The Shelby County Election Commission Board had "no authority to hold such a test" in the primary, he said. "I'm still not sure if the law allows such a test," Perkins, who is an attorney, said.

Weldon, however, said the court is "so busy talking [it] won't look at the system or try it."

"They say, 'We're not ready at this time, but we might be in two or three years. We want to defer.' But there is no time length given for the deferment."

Some of the components of the Shupe Co. machine might be manufactured in Tennessee, Weldon thought, but she declined comment on whether this was a factor in the court's decision.

The county election board is going to appeal the ruling to the state election commission to try to have the test in county elections in August, Weldon said.

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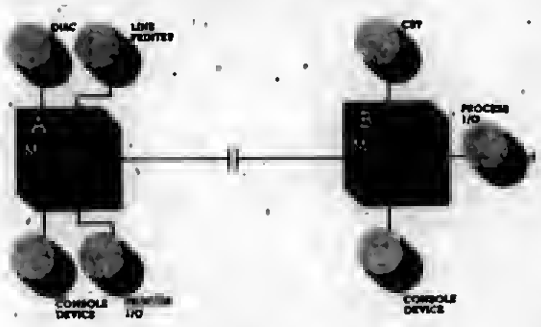

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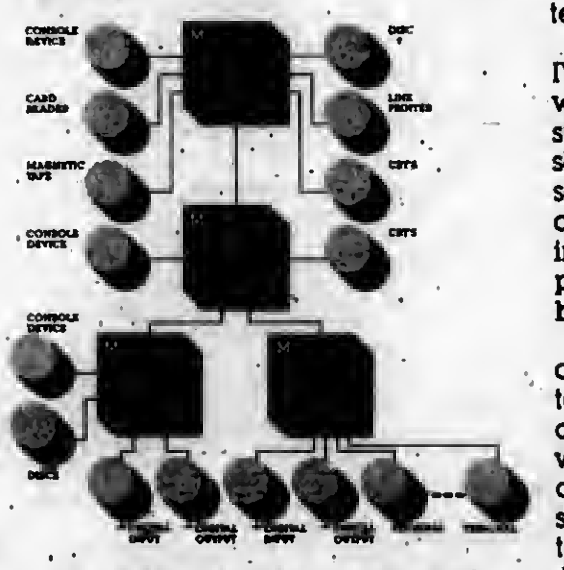

As the system has since evolved, a 32-bit MODCOMP IV now acts as host computer. Replacing (at a fraction of the cost) the company's former stand alone IBM 1800, the MODCOMP IV is expected to provide 10 to 25 times the throughput of the big machine, which had long since reached its saturation point.

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A NASA prime contractor has installed this highly sophisticated MODCOMP hierarchical network to handle complex stress and fatigue test analyses.

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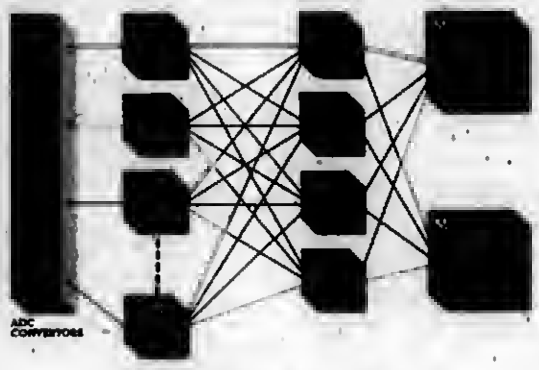

For clarity, peripheral devices omitted from this diagram.

Note: The MAXNET systems shown here are all resource-sharing networks of the type commonly used in laboratory and industrial measurement and control systems. For dedicated telecommunications applications, MODCOMP offers a separate software system called MAXCOM. For more information, send for our Data Communications brochure.

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Mini Helps Party Comply With Spending Report Rules

By Esther Surden
Of the CW Staff

WASHINGTON, D.C. – The Republican National Committee is using a minicomputer system to cope with the complex election spending reporting requirements imposed by the Federal Election Commission, according to Richard Thatcher, director of accounting and deputy treasurer for the committee.

A Microdata Corp. Reality system was purchased to replace a Burroughs Corp. L 5000 magnetic stripe electrocard system which wasn't powerful enough for the committee's needs, he said. A minicomputer was a necessity because of the need for immediate on-line access to data and for security purposes, Thatcher said.

The committee also considered Burroughs, Digital Equipment Corp. and IBM systems. The Microdata system was chosen because of its use of data base management techniques, on-line capabilities and use of Microdata's English languge.

Spotlight On Election Systems

The English was important because many of the members of the committee who might be accessing the data are not computer experts and needed a simple language, he said.

The system includes a Microdata 1600 central processor with 32K of core, a 10M-byte disk drive, four CRTs, a 300 line/min printer and a dial-up communications line that will allow communications between the committee and various affiliated committee members when operational. Additional ports are available for RS-232-type devices, he said.

The system cost $75,000 from Datatel, Inc., a Microdata dealer, Thatcher added.

Software for the system was designed by N.L.T. Computer Service in Nashville, Tenn. The software house was familiar with political work and so was considered the best to do the software job, Thatcher said. The firm developed the application packages specifically for the committee in three months, he added.

Applications on the system include accounting, some word processing, label making and the keeping of a data base of political information. Two CRTs are kept in the accounting office, and some will be located in the executive director's office, the political director's office and the operations center that coordinates political activities.

"Eventually, a CRT may even be located in the White House," Thatcher said.

The kind of information being kept on the elections includes the location of congressional divisions up for grabs, the names of the Republicans running, their opponents' names and a 1-to-10 rating system on whether the seat has been traditionally Republican, is shaky or has bean occupied by another party traditionally, Thatcher said.

The names of campaign managers and key people to contact for each division or senatorial seat will also be kept in the system.

This data base is subject to change, Thatcher added. For example, if the chairman wanted to know something that isn't included, the data element can be added to each record of the file. This assumes good data base preparation, Thatcher explained.

> *'Information being kept on the elections includes the location of congressional divisions up for grabs, the names of the Republicans running, their opponents' names and a 1-to-10 rating system on whether the seat has been traditionally Republican, is shaky or has been occupied by another party traditionally.'*

The system is too small to handle polling or voter opinion work, he added.

The system will also be able to let the committee know if spending limits for a particular race are being exceeded. This is very important because of new federal regulations, Thatcher said.

"Since I sign the reports, I have a double interest," he said.

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Mass. Firm Starts With Questionnaire

DP Helps Pollster Tailor Client Candidates' Campaigns

By Nancy French

Of the CW Staff

CAMBRIDGE, Mass. – Political candidates used to win elections by appealing to the ethnic, religious and educational orientation of their constituents.

But today's voters, who abandoned their parents' political ideas as casually as they left their old neighborhoods, are more difficult to categorize, political scientists have discovered.

Spotlight On Election Systems

Candidates who can afford it have therefore come to rely on computer-assisted public opinion polling firms to learn who their constituents are and what they think.

One such polling organization is Pat Cadell's Cambridge Survey Research, Inc.

A company whose first big job was researching Sen. George McGovern's campaign for President in 1972, the Cambridge group now boasts a client roster studded with the names of Democratic Presidential contender Jimmy Carter, Maine Sen. Edmund Muskie, Del. Sen Joe Biden, Iowa Sen. Dick Clark, R.I. Sen. Claiborn Pell and Colo. Sen. Floyd Haskell, for example.

Its service is "expensive" – usually only senators, governors and presidential candidates can afford it, according to senior analyst Dottie Lynch.

10% of Campaign Funds

Wealthy or not, those candidates have learned it makes sense to spend 10% of their campaign funds on research before investing in costly media campaigns and printed literature.

The objective of the researcher is to find out how voters feel about the client candidate, his opponents and the issues involved in the campaign. With this information in mind, a candidate can plan a strategy that emphasizes his strengths and deemphasizes his weaknesses, according to Lynch.

Secondly, the researcher must determine which types of voters strongly favor which candidate and which voters are undecided or "soft."

Little can be done to influence those with strong convictions, Lynch explained, so the undecided voters – especially those who seem to lean slightly toward the client candidate – are the voters the candidate concentrates on.

Thus a candidate with limited resources – and all candidates' resources are limited – can determine how much should be spent on TV commercials on which stations and how much should be allocated for newspaper ads and which newspapers should carry them.

The Cambridge group obtains this information from a 200-question voter questionnaire and a thorough computer analysis of the results.

The 200 questions are posed in face-to-face interviews rather than by telephone, Lynch said. Interviewees are selected statistically by neighborhood in each community polled, and an effort is made to get an equal number of men and women.

Sometimes a sample of the original interviewees are "paneled back," or telephoned in, at key points during the campaign to measure changes in voter attitudes.

A typical questionnaire includes a series of "agree/disagree" statements to determine how voters feel about subjects such as the economy, national defense and foreign affairs.

The questionnaire also contains a series of questions that provide an objective view of the candidate's image and reputation, she said.

Another series of questions gives researchers an idea of how they can reach selected voters through the media. Candidates are asked what newspapers and TV news programs they see and believe.

Once the questionnaires are completed, the answers are coded, keypunched and analyzed by computer.

The computer doesn't add any special dimension to the task – it just lets pollsters do a lot faster what would otherwise be done by hand, she said.

In most cases, turnaround time for a report, which includes everything from formulating the questions to conducting interviews, analyzing the results and writing the report, is about one month.

Survey data is reduced to manageable terms using a standard Simulation Program for the Social Sciences (SPSS) package from the National Opinion Research Center, according to Dean Smith, computer programmer.

Written in Fortran and Assembler, SPSS furnishes all necessary functions, including frequency counts, cross-tabulation tables, factor analysis and regression analysis, Smith said.

Once the computer prints out the results, the group writes what is usually about a 200-page report analyzing the questions, identifying the "soft" voters.

Samples Sometimes Wrong

It is not uncommon for a sample to turn out to be incorrect, Smith indicated. For example, "when results are in we often find the number of females interviewed outnumber the number of males. If this happens, the results are weighted to make the sexes numerically proportional."

When relationships are found, sometimes several categories are combined, Lynch said. For example, the alienation scale might be combined with other questions such as demographics to develop a composite score, she explained.

Many of the candidates are pretty surprised to see the results of these surveys, she indicated.

Joseph Timilty, a Massachusetts state senator who was defeated by a narrow margin in his race for Boston mayor against incumbent Kevin White, was shocked to find he was not known in the upper middle class liberal Back Bay and Beacon Hill areas of the city even though he had been active in Boston politics for eight years.

The survey found many potential Timilty voters in these areas – voters who were unhappy with Mayor Kevin White's performance.

The survey also found voters in these two areas were highly interested in two issues not usually associated with upper middle class liberal voters – crime and problems of the elderly.

Going by the traditional patterns, Timilty would have emphasized crime only in black and ethnic neighborhoods and problems of the elderly in neighborhoods with a larger proportion of elderly residents, Lynch explained.

Lynch refused to discuss the work now being done for Carter, but offered examples from the McGovern race.

In June 1972, she said, the Cambridge research group interviewed 13,000 voters nationwide using local interviewers.

The information was analyzed and a report was written. Then, in September, 1,300 of those voters were "paneled back" by telephone to measure the impact of Thomas E. Eagleton's resignation as McGovern's running mate.

The polls revealed even then just how bad things were, she said.

Although Nixon was not well liked among the voters, McGovern's problem was worse: people simply didn't believe he was competent, Lynch recalled.

The election results were no surprise, she said.

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Editorial

User Voice Needed

A giant battle is shaping up in Washington, D.C., that may determine how users of data communications will have to operate in the future and – once again – the user is almost the only one who will have no organized voice in the matter.

AT&T has hauled out heavy artillery for the battle by urging its millions of shareholders to present their views on the proposed Consumer Communications Reform Act to the Congress.

And the firm is apparently sparing no expense or manpower in the effort to make its position supporting the act clear to the legislators of Capitol Hill [CW, May 24].

On the other side of the battle lines are the specialized common carriers and interconnect equipment manufacturers – and they're not ready to let AT&T take the Capitol by default.

These manufacturers have banded together in the Ad Hoc Committee for Competitive Telecommunications and will give Bell a run fot its money in the hallways and cloakrooms of the Capitol – even if they may seem outgunned and outmanned by the sheer size of AT&T.

This group will also have an ally in the Computer Industry Association, which has already begun speaking out against the concepts embodied in the Bell-sponsored legislation, and other vendor organizations such as the Independent Data Communications Manufacturers Association.

It promises to be a battle royal, but no one is representing *you* – the user – and *you* will have to pay the piper one way or the other.

There is no strong user organization in existence that will take a stand on these issues, not one group that can be depended upon to make the users' views known to the Congress; yet the users will be the ones most affected by any legislation that is either passed or defeated.

Computer users have for years banded together in solely professional organizations – the Association for Computing Machinery, the Data Processing Management Association and so forth.

All of these organizations are established as educational and professional societies, and under the U.S. tax code they are barred from any activity that smacks of lobbying; even activities that only remotely could be called lobbying scare them off because they cannot afford to lose that cherished tax status.

There is no easy solution to this problem. For too many years, DP people have seen themselves as disinterested professionals and have refused to band together into any strong group representing users.

Now – once again – users are reaping the crop of years of indifference. Once again, a major battle will rage around DPers who will not take sides. If they lose, it will be largely their fault since they refused to become involved.

About all an interested user can do now is to study the proposed legislation and write directly to the local congressman expressing his views on it.

But such an effort will hardly have the effect that the lobbying by the two professional sides in the argument will have.

Users should write, make themselves known, but they also need to do a lot of hoping and praying that the results will not be too unfavorable for them.

They also might learn a lesson and decide it's time to get an organization that can represent their interests in future battles of this type.

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Computerworld

'How Come I Never Get Any of the Interesting Stuff?'

Letters to the Editor

Display, Report Design at Fault In Error Causing Inmate Suicide

The article about the Yonkers, N.Y., police communications employee who was blamed for the suicide of a jail inmate [CW, May 17] typified the "communication" gap between the programmer/analyst and the user.

Too many times I've seen the garbage foisted off on the user in the form of cluttered and unintelligible CRT screens or superabbreviated reports full of unedited digits.

There doesn't appear to be any good purpose served by taking disciplinary action against the CRT operator when the error was a result of inadequate training of the operator by the police department, compounded by a vague and misleading code.

Furthermore, the inmate died at his own hands and not at the hands of the operator.

Nevertheless, it is my personal opinion that some people who are responsible for the design of displays and reports ought to spend more time in the user's shoes and consider such things as ease of operator training and report interpretation long after the designer has left the scene.

Marvin Cruzan

Kansas City, Mo.

Article Out of Place in CW

In reference to the article in the May 17 issue, I found it very hard to believe that anybody in his right mind would take his life because of a misinterpretation of a parole violation.

This article belonged in *The Enquirer* rather than in *Computerworld*.

John F. Luke

Cloquet, Minn.

What Happened to March?

Monty Goolsby's letter [CW, May 17] indicated that on Feb. 28, 2100 at midnight the calendar will change to April 1.

I cannot help but wonder what will happen to the month of March for that year. I do not think I will try to program for this change.

Robert L. Tipton

Emporia, Kan.

Our fault. It should have read March 1. Ed.

Hardware May Replace 'Orgware'

I noted with interest a letter in the May 17 issue from Gerald M. Weinberg in which the term "peopleware" was deplored.

I suggest the most serious objection to this term is that it contains one syllable too many (vide: hard-ware, firm-ware, peo-ple-ware). This fault can be remedied by substituting the word: "orgware."

"Orgware" is that part of the data processing environment which is implemented in organic substances (keypunchers, programmers, analysts, etc.).

The most significant observed differences between orgware and other components of a DP establishment are:

- Orgware components have a shorter mean time between failures than other components.
- Orgware components are subject to less conscientious maintenance and more infrequent upgrades than other components.

I believe major development efforts are under way in the computer manufacturing industry to replace expensive, unreliable orgware with cheap, reliable hardware and firmware.

Bradford McCormick

Baltimore, Md.

(Other letters are on Pages 26, 36 and 37.)

Data Past

Five Years Ago
June 9, 1971

PHOENIX – Motor Replacement Corp. (MRC) dropped a $5 billion class-action suit against IBM challenging the industry leader's unbundling practices. No other users had come forth to join the legal action.

– – –

MIAMI – Eastern Air Lines (EAL) tried to win a cash tax rebate by proving in court IBM's preunbundling software and support were actually worth 55% of the catalog price of its system.

Eight Years Ago
June 5, 1968

LOS ANGELES – Western Union (WU) and Computer Sciences Corp. (CSC) neared final negotiations on a proposed merger that would, in effect, put CSC on-line with the entire country, as WU had made known its intention to become a nationwide information utility network. University Computing Co. (UCC) also in the running for a merger with WU, withdrew its $44 per share offer for WU stock. Industry sources viewed the action by CSC as simply a move to halt negotiations between UCC and WU.

– – –

HANOVER, N.H. – An order placed by Time-Share Corp. here with Hewlett-Packard Co. (HP) marked the entry both of HP into the time-sharing computer vendor business and of Time-Share into the time-sharing service market. Five HP 2000A computers, with some modifications, were delivered to the computer time vendor.

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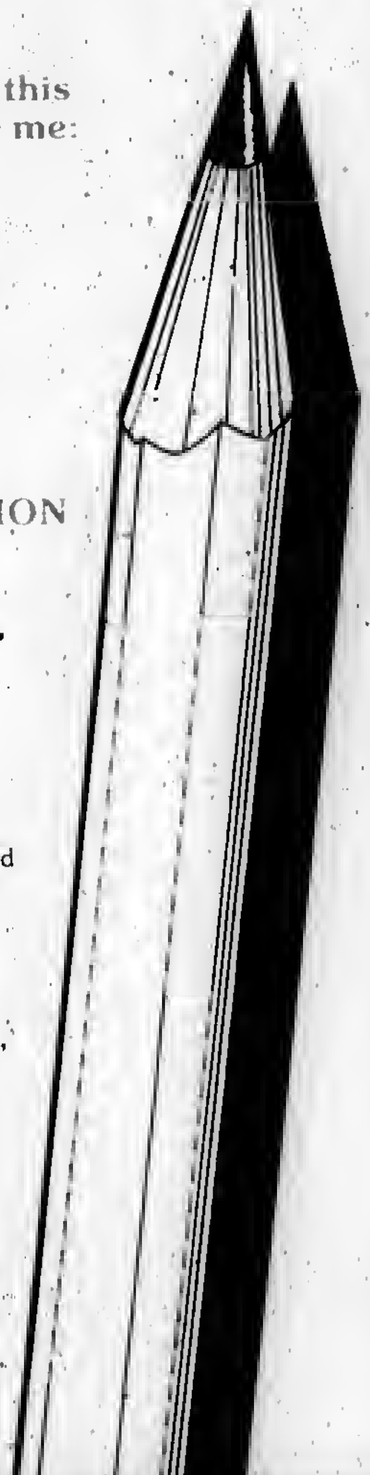

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Distributed Intelligence

I haven't done as many Computer Caravans this year as usual, due to my new California address and to a narrower relationship with CW activities. But at the three where I did help (Chicago, Los Angeles, and San Francisco) I had fun doing the minicomputer workshops, as well as reading the Annual Message, an editorial estimate of major trends, especially as affecting workshop tactics.

Part of the fun lay in skirting carefully the Scylla of false enthusiasm – "Grosch's Law is dead: long live the mini!" – and the Charybdis of excessive dourness – "What was good enough for your granddad and me is good enough for you!" And in addition, the special area of distributed intelligence, or more precisely, distributed data and distributed control, is the favorite parade ground of my favorite Naval Person, Grace Hopper. So the trick is to tread lightly, smile wryly, and hope the audience senses my doubts.

How pleasant, then, to read in my own paper [CW; May 3] a nice, clear statement from the top computer man in Honeywell, Clancy Spangle, that I can quote fondly for the next year or so. "It will be five years or more before distributed systems become a substantial part of the data processing mainstream," he said. Hear, hear, Clancy!

He referred at length to problems of hardware and communications economics, to severe organizational hazards – human organization, that is – and of course to the overwhelming difficulty of software, especially control software. Quote after quote was accurate, farsighted and, especially from such a senior boss, authoritative.

I'd like to direct a little extra attention to the dimensions of the control problem. Clancy doesn't emphasize it as much as he does the centralization/decentralization sort of thing; I think it's overwhelmingly the most important factor. Consider the situation in a really fancy scheme: you have portions of each class of data stored in various computers ("nodes"), you have each applications program stored at a limited number of nodes, you have indices of data location and program location stored – well, stored *somewhere*. If you put all the indices in one place, that node is more important, more central than the others: the beginning of a hierarchy. If you distribute completely, you must have pointers at every node, entry programs at every node, steering you into the indices and then on, via end-of-line linkages, to further control.

Remember, the nodes will most certainly *not* be identical. At the very least, they will have different memory capabilities; more often, different memory tapes, different peripherals, even different CPUs. Thus either the major control overlays, wherever they are, must keep count of the characteristics of each and every node; or, horrible thought, there must be a virtual network on top of the real one, automatically shuffling packets of data and code around as nodes fill up their memories or run out of CPU power.

And where will you put *that*, my ambitious friends? The problem is in a very real sense recursive; to spread the system over many nodes takes an elaborate control, which soon grows too large and itself must be distributed; its activation in turn calls for higher control, and so on up into the stratosphere. No doubt the software can be made to, ah, converge; no doubt a very closely written top-control can be small enough to duplicate at every node or every port of the system. But it won't be easy!

And in what elegant and abstract language will all this be done? I'd suppose one of the more powerful list processing languages, a later version of what Fred Thompson passed on to me at DEACON and later reconstructed at Cal Tech. But the compilers and debug routines of latter-day LISPs are also very large (and slow) by minicomputer memory (and CPU) cost standards.

My own guess is that for many more than Clancy's five years, every very ambitious or academic (that is, throughput-insensitive) network will be semicentralized: somewhere there will be a Big Node, a veritable bunion of a node, where the list-processor and the indices and most of the system control will reside. Entry at all other nodes will be routed first to that special node, and from there flow out to where the data and the applications programs are, and back – probably via the chief node again – to the point of entry or a more powerful "adjacent" point.

That, we might do in five years: not, I'd guess, much sooner. We don't do anything that powerful on ARPANET; the control overlay is almost entirely human, and in documentation rather than on disk. And dozens of languages vie for eminence up and down the data communication links, to the greater glory of the profession; the greater confusion of the sponsor, and the greater impoverishment of the taxpayer.

I look two ways. On the one hand, if I yearned for a practical mini net, to do real work for budgeted dollars, I'd make the nodes compatible and preferably identical, even at the cost of some wasted hardware at less vigorously-used nodes. I'd permit one, or in a very large net, a small number of supernodes. And I'd do top control from a looseleaf notebook at the super-node(s).

But if I wanted to build a genuine intellectual monument – and it would be; I mean it – I'd forget about hardware and list-processor characteristics and data communications protocols, and even applications. I'd go off to a monastery in Los Gatos or Novosibirsk and draw plans on Klein-bottle-shaped blackboards with hexadecimal chalk for a few years. Grace is right; it *can* be done. Distributed "intelligence" can come. But it will be difficult as Apollo – and in the long run, perhaps no more rewarding?

Herb Grosch

Random Decisions Result of Ignoring Default Problem

The Taylor Report
By
Alan Taylor, CDP

The default characteristic of an operating system has long been known as a most important item. In fact, the development of better and better software over the past 20 years can be remarkably paralleled by the development of systematic hardware and software defaults and our understanding of default systems.

However, defaults are not an obvious study. Few systems, as they are developed, contain more than spotty cases of defaults being provided, and hardly any have a developed and considered default system. The results in many cases are loopholes, inconsistencies and random decisions being made and explained in odd ways.

As a homely example, consider the legal system put forward as a result of the various credit agency abuses. A legal system is not a computer, but many of the same rules apply to any system.

What happened was that Jordan Marsh, a local department store, approached my wife while shipping, asking for her to fill in a credit application form, so that she could get advance information about sales and other items. She did, gave the form back and a week later got a Form RFD Rev. 2 letter refusing the application. This response gave two underlying reasons: that TRW Credit Data was apparently 'unable' to supply any information on her and that Jordan Marsh had been 'unable to verify income.'

In accordnance with the various legal rules, additional information was given, such as the address of the local Federal Trade Commission (FTC) office that handles discrimination against credit applicants and the fact that if an insufficient or unwelcome 'consumer credit report' was the basis, then copies of this were available free from the agency.

In this case, where no credit report was obtained, this latter didn't apply.

Legal System Default

That brings up the first system default problem. If a person has no record, does that give him less standing than someone who has a bad record?

The question of what to do when there is no record supplied (which is all that Jordan Marsh can know happened, despite the claim that TRW was "unable to verify income") is a first-level default. It is an important one so far as the intent of the law regarding the use of credit reports was concerned.

If the absence of such a report is usable as a reason for declining credit, all that is needed to evade the intent of the law is for TRW local offices to throw away any records they have on a person. This would, blamelessly, let the original abuses continue!

Clearly, if it had been anticipated that credit could be refused based upon an uncontrolled absence of a report, the law would have specified that in such a case the consumer would have the right to supply a report, in the same way that he has the right to supply a correction.

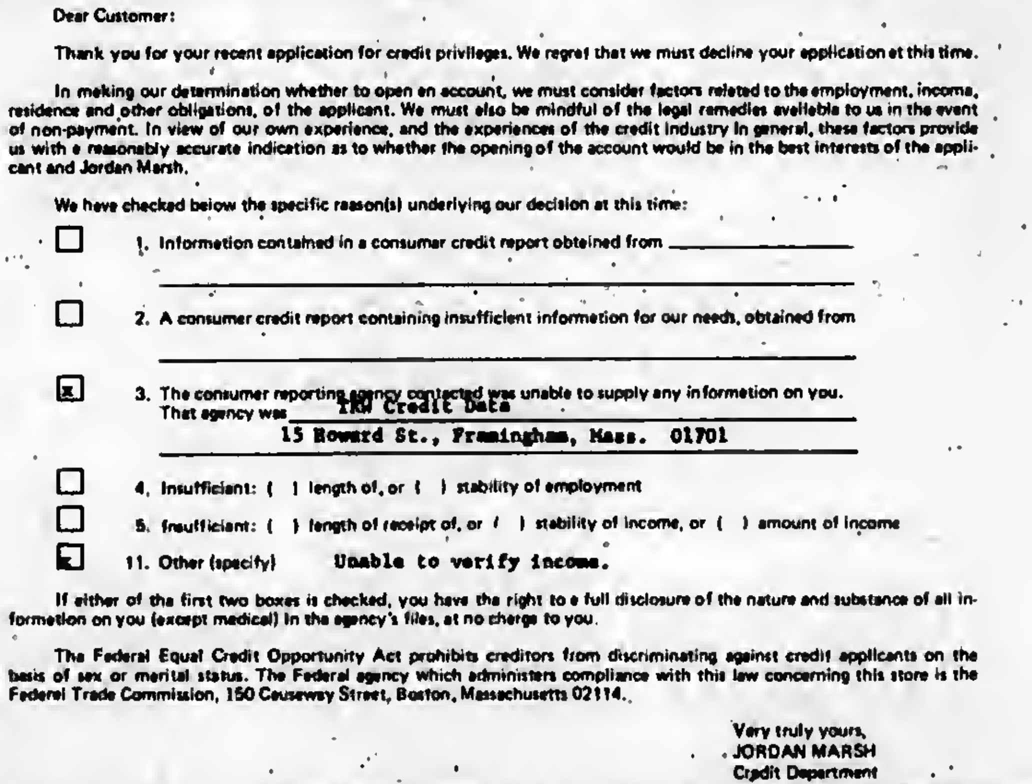
So here is a default characteristic that has apparently gone wrong. And putting it right may well take years – just like the errors to computer system defaults.

The second reasons Jordan Marsh gave was, interestingly enough, also a default reason. An inability to verify income, which Jordan Marsh claimed was its only other reason to decline the application, is a quickly curable item. Such an inability is perhaps something which could properly authorize the application to be held until some income verification was obtained, but Jordan's letter didn't suggest such a possibility.

In fact, it didn't even say how Jordan's attempted to verify income, which of course is a prerequisite to being correctly "unable" to verify something.

Did the banks refuse to say what income was involved in her accounts? I don't know – but I do know that Jordan's didn't ask ner employer to supply the information. So I just don't buy either the investigation or the absoluteness of the rejection for a reason that is

(Continued on Page 38)



Dear Customer:

Thank you for your recent application for credit privileges. We regret that we must decline your application at this time.

In making our determination whether to open an account, we must consider factors related to the employment, income, residence and other obligations, of the applicant. We must also be mindful of the legal remedies available to us in the event of non-payment. In view of our own experience, and the experiences of the credit industry in general, these factors provide us with a reasonably accurate indication as to whether the opening of the account would be in the best interests of the applicant and Jordan Marsh.

We have checked below the specific reason(s) underlying our decision at this time:

☐ 1. Information contained in a consumer credit report obtained from ____________

☐ 2. A consumer credit report containing insufficient information for our needs, obtained from ____________

☒ 3. The consumer reporting agency contacted was unable to supply any information on you. That agency was TRW Credit Data
15 Howard St., Framingham, Mass. 01701

☐ 4. Insufficient: ( ) length of, or ( ) stability of employment

☐ 5. Insufficient: ( ) length of receipt of, or ( ) stability of income, or ( ) amount of income

☒ 11. Other (specify) Unable to verify income.

If either of the first two boxes is checked, you have the right to a full disclosure of the nature and substance of all information on you (except medical) in the agency's files, at no charge to you.

The Federal Equal Credit Opportunity Act prohibits creditors from discriminating against credit applicants on the basis of sex or marital status. The Federal agency which administers compliance with this law concerning this store is the Federal Trade Commission, 150 Causeway Street, Boston, Massachusetts 02114.

Very truly yours,
JORDAN MARSH
Credit Department

The letter shown above uses default decisions to arrive at a conclusion. Reviews of these types of homely decisions can be the basis for improving automated decision-making applications on computers.

Letters to the Editor

No Need for Dump Debugging If Right Language Used

I read with interest the position taken by B.H. Boar concerning the use of dumps to debug programs [CW, April 26].

I was somewhat amazed that shops can continue to use the antiquated dump as a tool to accomplish everyday debugging, and I was reminded that, regardless of how far we have come, there continues to exist a communication gap of enormous proportions between the users and designers of the various languages in use today.

Surprising as it may seem, there is no real need for dumps if a shop uses a language that is designed not just for the executing system, but also for the programmer. If one examines any trade publication, almost without exception, one will see that emphasis is placed these days on programmer efficiency, not simply machine efficiency.

It has been possible since the early IBM 360 days to give programmers tools that can eliminate the need for most dumps. The only thing lacking is the desire to do so and the conviction that if the user is not apathetic to the vendor and/or the language, a change can be forced.

When a programmer experiences a data exception, there is no need to get a dump. The language can support, at a reasonable cost, the facility to tell the programmer in his terms exactly what has gone awry. It can tell him what procedure has the error, what statement is in error and even which field is in error and it can do so in batch, remote job entry or interactive environments.

To carry a good thing even further, the day is rapidly approaching where the hardware will be able to accomplish this feat, not just the language.

The core dump in many shops is a relic, confined only to those problems that are highly complex, totally transient and real bears! Perhaps if those individuals like Boar really dislike core dumps, they should look toward other languages with which dumps are mostly a thing of the past, and the best one I know of is PL/I.

Lee Milligan

Bloomington, Ill.

Women No Minority

In re the letter of Valerie Van Holten et al [CW, May 17].

Since I had read the April 25 issue and not noted anything complaint-worthy – however subtle – I reviewed it:

The Raytheon Data Systems advertisement on Page 30 and the Optical Business Machines, Inc. advertisement on Page 25, in my eyes, were the ads Valerie Van Holten et al should have complained about [CW, May 17].

If advertisements with only men in them offended them, they missed many others.

Females as uptight as these do their cause a disservice. Men like myself who cheer the Janet Guthries are disappointed.

One thing I am absolutely positive about is that women are no minority.

William Boyla

Detroit, Mich.

A Problem With Titles

After 17 years in data processing, I must ask Valerie Van Holten et al who, in the May 17 issue, protested the "blatant and subtle discrimination practices of the computer industry," the simple question: What in the hell is an "acting head," and what in the same place is a "computer specialist?"

Could it be something like a systems analyst who never learned to program or female programmers, who insist that their male colleagues move the heavy forms boxes around for them?

Finally, how can something be subtle and blatant at the same time?

Frank K. Binder

Cambridge, Mass.

Wonder Woman at Her Finest

In all fairness, how can the blur in the background of the Northrup Data System ad on Page 47 of the April 26 issue be designated a "male" computer person and draw the ire of our female counterparts [CW, May 17]?

To me, it looked like Wonder Woman at her finest.

C. Daniel Moore

Marietta, Ga.

A Marker Suggestion

As the marker for the articles on the importance of proper selection, training and motivation of the people who select and use computer hardware and software [CW, May 17], why not simply use "The Human Connections"?

Jacquelyn (Haki) Evans

San Franscico, Calif.

RESPONSE TIME PROBLEMS?

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INNOVATIONS FROM

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Many business firms, governmental agencies, scientific/engineering groups, and educational institutions found their data processing needs could be met only by large systems priced outside their budget. Not any more.

The Hewlett-Packard 3000 Series II now makes large system capabilities affordable. Advances like concurrent batch and interactive terminal processing, Firmware-Assisted Software, Fault Control Memory, sophisticated data base management, virtual memory, full system security, job accounting, processing in five languages and data processing done locally or remotely via teleprocessing mean you can have all the performance you need in a new general purpose computer.

The price is within the affordable range of \$110,000 to \$300,000* and the HP-3000 Series II has the standards of performance, reliability, and quality inherent in the Hewlett-Packard name. If you plan to install a computer or upgrade your present system, you owe it to yourself to get all the facts. Read on▶

*U.S. domestic prices FOB California.

HEWLETT-PACKARD ANNOUNCES THE HP-3000 SERIES II

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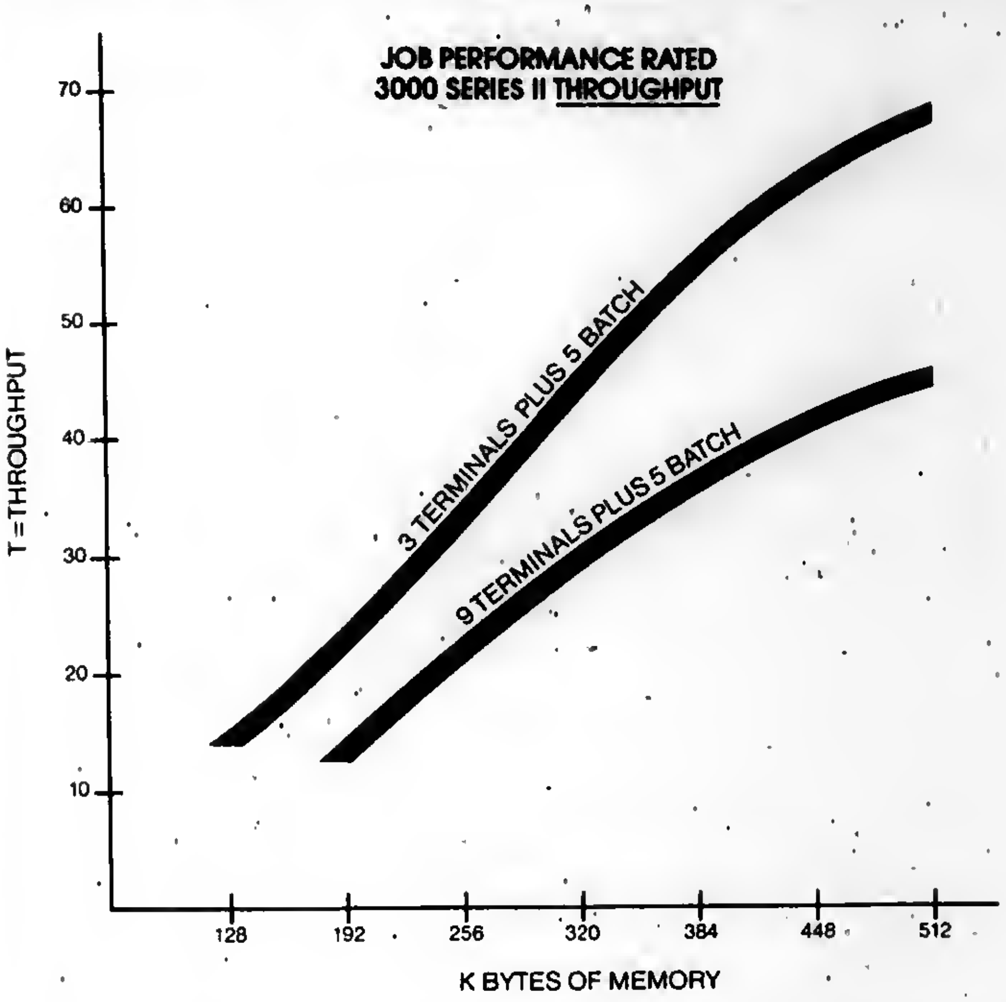
HEWLETT-PACKARD SERIES II IS JOB PERFORMANCE RATED



BUSINESS DP MIX

3 & 9 INTERACTIVE USERS	5 BATCH USERS
• COBOL program development of 3359 lines of code at .3 Char/Sec. rate repeatedly.	• 85 statement RPG compile and execute 2 key SORT on 17 records, 292 statement RPG compile, execute and print 750 line report. • Disc to disc copy of 3359 source records. • SORT 80byte, 10,000 record file on 3 keys. • COBOL compile of 3359 statement program. • IMAGE data base management program in 700 statement COBOL program updating and deleting in random order each record of a 500 record data base.

Evaluating a multi-programming interactive computer system is perplexing. Available benchmarks for stand alone, sequential batch machines do not apply to an on-line multi-programming system. This causes a real problem.

The design of the HP3000 Series II brought with it an opportunity to address that problem. To simplify a prospect's task of evaluation, the HP3000 Series II performance has been measured. Both the throughput and response times for Series II Systems have been quantified. The Series II is "job performance rated."

A test performance simulator helped the Series II design engineers optimize system parameters. From these simulations evolved the idea to job performance rate the HP3000 Series II for both terminal response time and system throughput.

Accurate measurements of the response time of the Series II were obtained from a hardware simulator driven by an HP2100 mini-computer. Together with special software, it has the ability to simulate any number and variety of interactive user inputs to the Series II, to measure the amount of time for a response to a terminal and then to log the data. To closely approximate the real world, the simulation was designed to include user typing time, and to statistically generate random "think" time.

Next, job mixes were defined typical of Series II data processing, scientific, and timesharing environments. The scientific mix used an assortment of FORTRAN and BASIC programs run in both batch and interactive mode. The data processing mix utilized a variety of RPG and COBOL programs and compilations, file sorts and data base manipulations.

Then, each job mix was actually run on standard non-optimized Series II Models of varying memory sizes. Each job mix was run first for one hour with the addition of three interactive users, and then for another hour with nine interactive users. At the end of each hour, batch job completions were counted and the terminal response times were averaged.

A throughput factor (T) was defined based upon the number of job completions, and normalized to a unit job. This expression of the value of work done by the entire system in one hour, was plotted on a graph. Another graph of average interactive terminal response time was plotted.

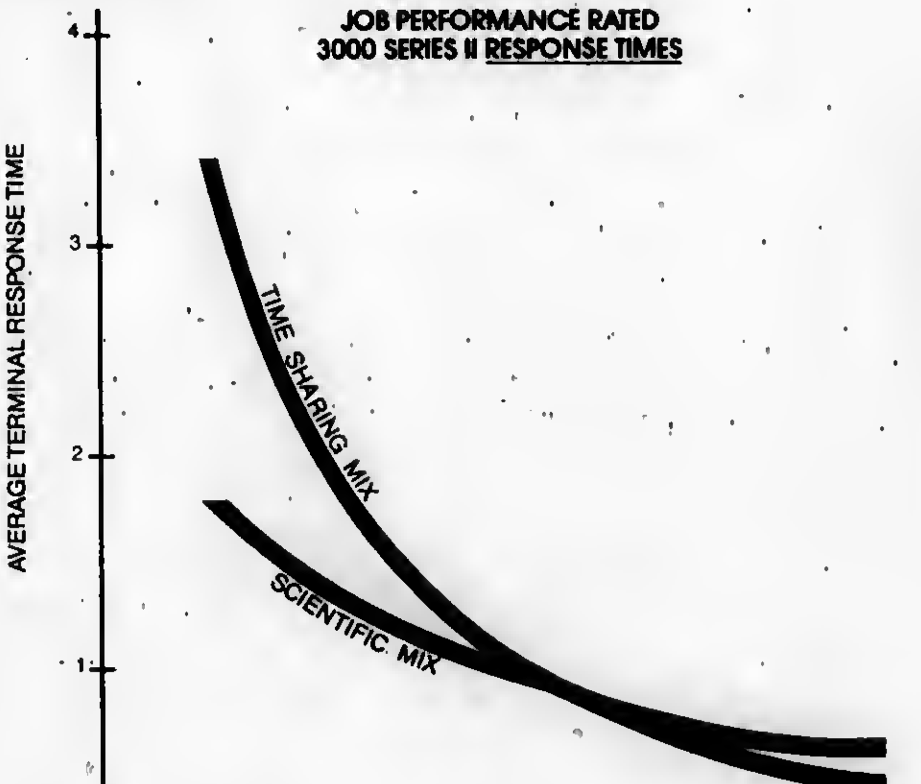
The job mix descriptions, although typical, can not represent every possible application. But together with the ratings of job throughput and response, the job mixes and ratings define what the HP3000 Series II can do in a series of environments. Job performance rating is an attempt to address the problem of measuring interactive multi-programming machines. Hewlett-Packard offers the results of this job performance rating technique to help prospects evaluate whether the HP3000 Series II capabilities match their computing needs. For more information check C on the response card to receive your copy of "Performance Summary."

TIMESHARING MIX

13 INTERACTIVE USERS	2 BATCH USERS
Enter BASIC interpreter, Retrieve prestored BASIC program from disc, Modify the program, List parts of it, Execute the program feeding it 4 date records. Repeat preceding three lines. Name the program. Save the program. Exit the BASIC interpreter. Repeat.	• A 4000 line BASIC compiled program generating a disc file end printing a 500 line report. • Above job executed under BASIC interpreter.

SCIENTIFIC MIX

6 INTERACTIVE USERS	4 BATCH USERS
• 3.FORTRAN program development. • 3 BASIC interpreter program development.	• 4000 statement BASIC program compile, execute and print a 500 line report. • 1360 stetement FORTRAN compile, execute end print of a 29 page report. • A 4000 line BASIC compiled program generating a disc file and printing e 500 line report. • Above job executed under BASIC interpreter.



INNOVATIONS IN MEMORY TECHNOLOGY

Memory With A Memory

The Series II features new $84 per kilobyte semiconductor memory. To ensure memory reliability, the process of isolating memory errors is ongoing throughout the life of each Series II system.

Experience has shown that failures in semiconductor memory typically occur early in the life cycle. Consequently, pre-production RAMS are subjected to extensive "burn-ins" and computerized testing. Further oven tests monitored by computer are conducted on chips mounted on circuit boards and built into computers.

Testing for memory faults continues even after the system is installed at a customer site. A significant characteristic of the HP3000 Series II memory is its ability to correct single bit errors. Five checking bits not only determine when an error occurs in any 21-bit word (16-data bits, and 5-error correcting bits) but also locate and correct the failing bit. Fault correcting memory is not new in the computer industry, but a memory with defective chips is inherently less reliable, so the Series II memory remembers its faults. Information necessary to locate error prone chips is recorded in a logging RAM. Approximately once per hour, the information is automatically written to a disc file by the Series II operating system. A program can be run at any time to list a report identifying each chip that has failed and indicating the number of times a failure has occurred. With this information in hand, the HP customer engineer can simply replace faulty chips during routine maintenance.

The entire Fault Control process occurs without loss of memory speed, and, as the memory self-corrects, without urgency. Defective chips can be replaced at leisure. This unique Fault Control memory with error logging is innovative in the computer industry. The HP3000 Series II introduces memory with a memory.

Use of dynamic MOS semi-conductor memory results in costs savings that are passed on to the customer. A core 32K byte memory board for the 3000CX cost $10,000. The new Series II 64K byte semi-conductor memory module with 18 pin 4K RAMS costs only $5,400. Series II memory brings twice the density at approximately one-half the price.

Series II memory is large, expandable to 512 bytes; and fast. Memory access time is 350 nanoseconds. Semi-conductor memory is volatile, so a standard sixty minute battery supply supports the memory during brownouts and power failures.

Memory With A Manager

The Series II uses high-speed discs to augment main memory in an efficient scheme known as virtual memory. A Memory Allocation Manager (MAM) controls needed transfers or "swaps" of programs and data between disc and main memory.

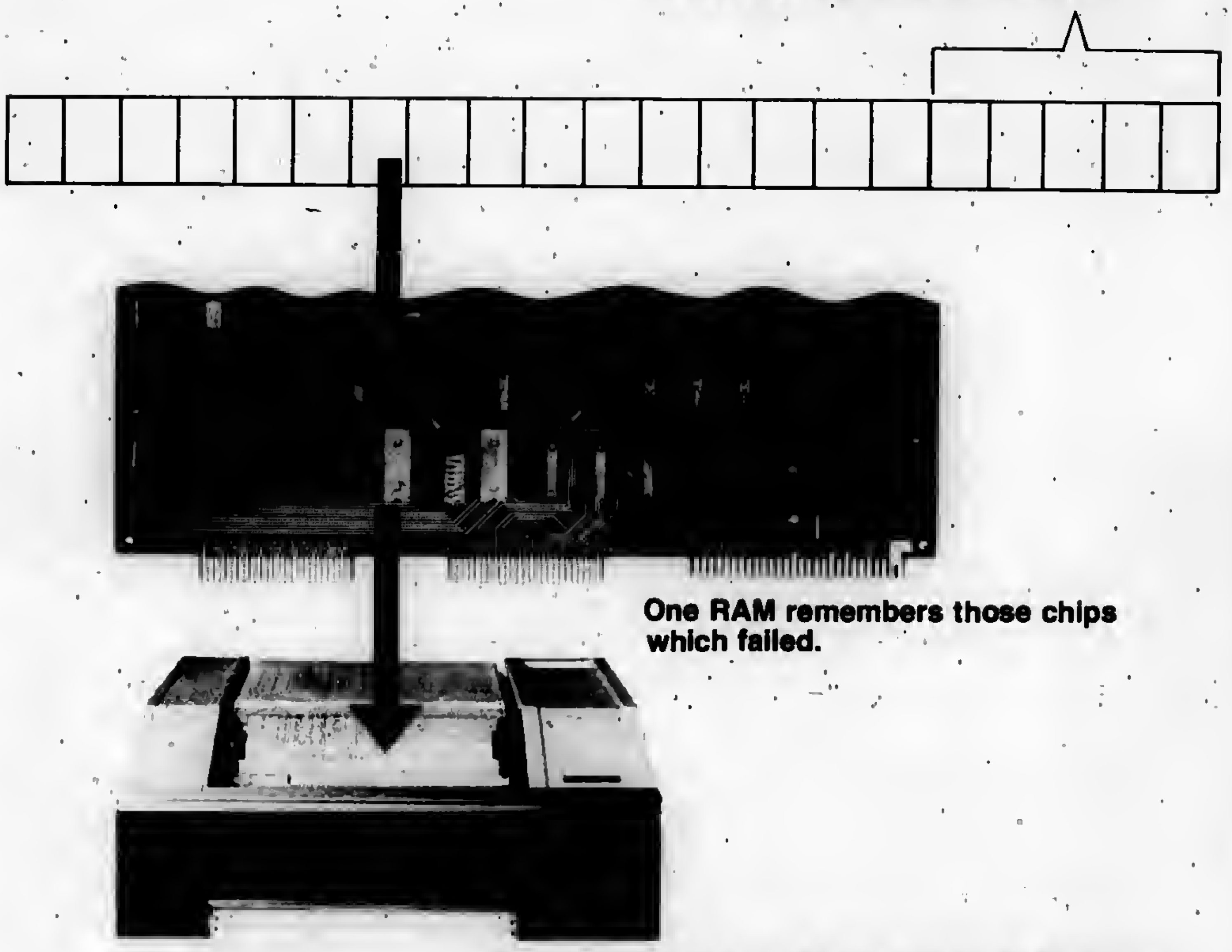
The fundamental unit of virtual memory transfer is a variable length segment of logically related information. In a virtual memory system, efficiency is gained when needed segments are ready in main memory and do not require a time consuming swap from disc. Implementation of a new algorithm used by MAM maximizes this efficiency. The "Segment Frequency Algorithm" (SFA) keeps a running history of segment use in main memory. Only segments whose past history indicates a high percentage of reuse remain in main memory. Each program is given just enough main memory to run efficiently.

Memory checkerboarding is reduced by MAM. The Memory Allocation Manager finds needed memory space by careful relocation of a segment if it separates two "free" areas. This technique (known as the "Local Compression Algorith") creates free space, and discourages fragmentation of main memory.

To receive a technical summary of the Series II check B on the reply card.

Fault Control Memory

Five bits check and correct the 3000 Series II semi-conductor memory.



One RAM remembers those chips which failed.

A report indicates which faulty chips should be replaced. Until then Series II Fault Control memory keeps on correcting with no loss of memory speed.

Advertisement

HEWLETT-PACKARD 3000 SERIES II FEATURES FIRMWARE ASSISTED SOFTWARE

In the 3000 Series II, Hewlett-Packard has gone beyond implementing the base instruction set of the CPU in microcode. Parts of the operating system that normally would be software have been microcoded. We like to refer to these as "Firmware-Assisted Software".

These operating system functions, if executed in non-firmware-assisted software, would be characterized by lengthy program sequences. In their Series II microcoded form, the single composite instruction executes in a few cycles of the microprogrammed CPU. Microcoding means high-processing speeds and a high result/instruction ratio.

One example of such time savings is the "IXIT" instruction. "IXIT's" most common usage is to determine if the scheduler's existing job queue and priorities need to be reexamined as the result of an I/O interrupt. If a reprioritizing is indicated, "IXIT" activates the dormant "Dispatcher." When executed in software form, this procedure took 155 microseconds. Now, in its Firmware-Assisted Software form, execution-time is 24 microseconds or six and one half times faster. One single firmware instruction replaced approximately 30 software instructions.

Firmware-Assisted Software functions for the HP3000 Series II include repetitive operations like subprogram linkage, string processing, buffer transfers, and such integral functions as the "Dispatcher" or scheduler.

Heart of the Hewlett-Packard 3000 Series II is a 32-bit, pipelined, microprogrammed processor with a cycle time of 175 nanoseconds. This microprogrammed processor supports 209 instructions. Eighteen of these standard instructions are extended, precision floating-point and decimal operations. The microcode instructions and Firmware-Assisted Software occupy 4K microprogramming words. The HP3000 Series II has a total of 10K words of control store available accommodating an additional 6K for future growth.

The most frequently used software code required by the operating system has been designed into the HP3000 Series II micro-programmed processor. The result is speed and efficiency.

For more information check B on the reply card.

THE SPEEDY DISPATCHER

"Firmware-Assisted Software" is the key to the Series II ability to support up to 63 interactive users. With so many users bidding for CPU attention at the same time, the role of the "Dispatcher" or scheduler is critical to the successful operation of the Series II on-line multi-programming system. The Dispatcher switches CPU resources from one competing user to another. The more immediate the switching, the less system overhead diminishes available user time. Firmware-Assisted Software allows the Dispatcher to switch in only 750 microseconds.

ONE SECOND IN THE LIFE OF A SERIES II

To explore the internal intricacies of a concurrent batch and interactive system, we tracked MPE II, the powerful multi-programming operating system of the Series II, for one second. MPE II dynamically allocates resources such as main memory, processing time, and peripheral devices to each user as needed.

The state-of-the-art "working set" memory manager employs a "Segment Frequency Algorithm" (SFA) to optimize main virtual memory use. In this second, jobs similar to the data processing mix described earlier are handled by MPE II. Just to keep the processors active, three more interactive users were added for a total job mix of four-batch and six-interactive users.

EDIT 1 The second starts off with the all important Dispatcher checking its internal queue of ready users. First on the list is an interactive user in the EDITOR subsystem working through program modifications. With the three-milliseconds of CPU time, our busy editor modifies COBOL source code. The modified lines are quickly transferred back out to disc, to prepare space for the next set of lines to be modified. The system's separate I/O processor handled this data movement at the same time the CPU continued with the next activity. Time Check: 3 Milliseconds.

The CPU can't ignore the energetic Spooler one millisecond longer. The Spooler's role in life is to keep track and prioritize those who need non-shareable devices like mag tapes and printers. The Spooler has been handling an earlier request to print out a listing. It sets up another 16 lines in main memory ready to begin automatic printing. Time Check: 34 Milliseconds.

EDIT 2 No rest for the hustling line printer. Another interactive COBOL user has decided to take a hard-copy version of his program home to study in peace and quiet. However, some system code necessary to perform this operation isn't in main memory and there's no space. The CPU needs the aid of the Memory Allocation Manager (MAM). MAM is responsible for making virtual memory a reality. In this instance, MAM performs two functions: First it determines those segments of memory that have fallen into disuse and are available as free space. Next, it uses the Local Compression Algorithm to consolidate selected free memory spaces into one contiguous area. Now MAM can swap the needed code in from disc to main memory and complete the request. Time Check: 50 Milliseconds.

EDIT 1 Meanwhile, the first interactive COBOL user is still modifying source. Some of the code he's using is identical to that used by other interactive users on the system. The Series II cleverly stores code (program instructions) and data (program variables) separately in main memory so that such identical code segments can be shared. This is a great way to save memory space. A few more lines are modified. Time Check: 66 Milliseconds.

COBOL A batch user requests data to be moved from disc file to a working space in main memory while the separate I/O processor handles this data transfer. Time Check: 71 Milliseconds.

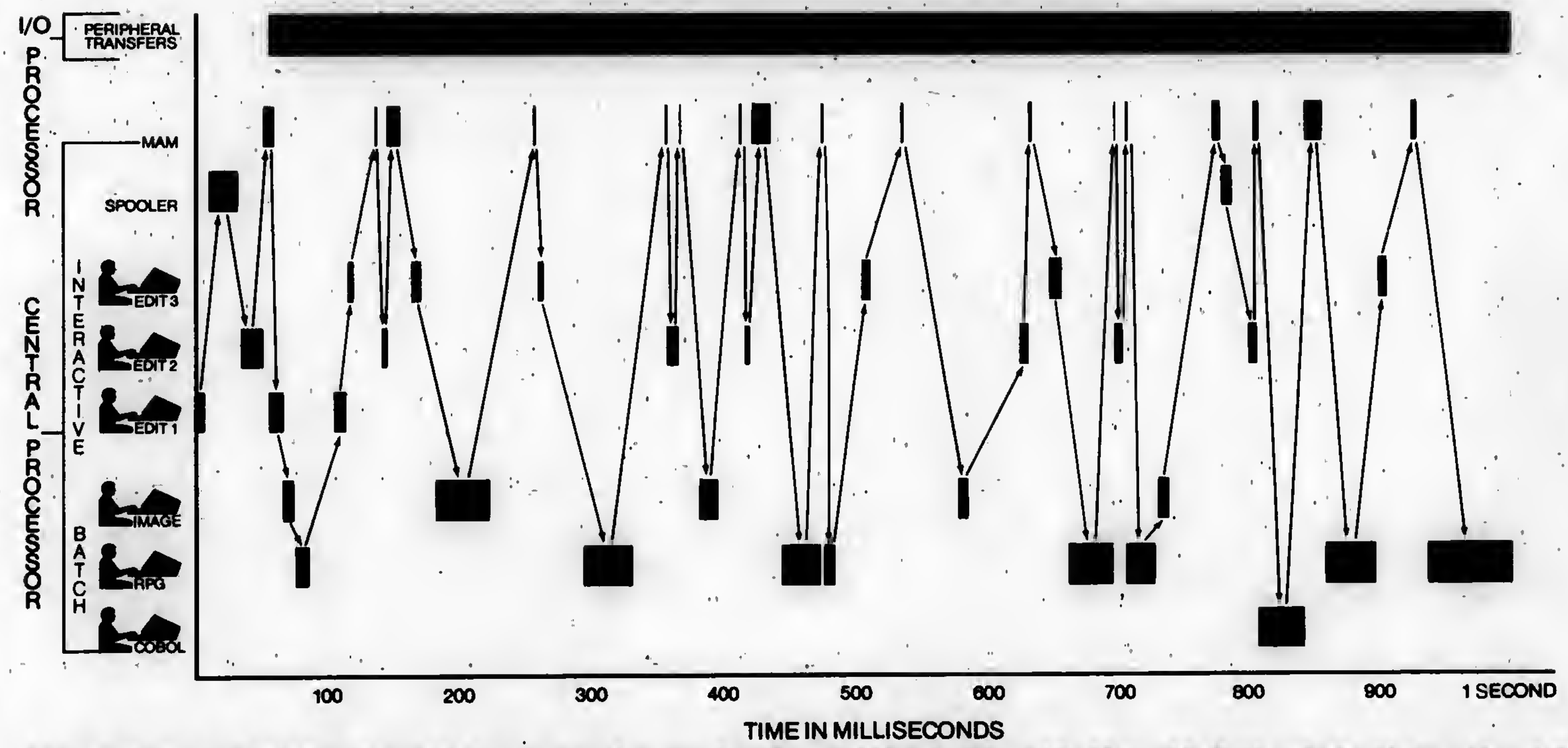
RPG Simultaneously the CPU is given to an RPG compile which requests another data transfer. Time Check: 84 Milliseconds.

EDIT 1 Remember our first COBOL user? With this swatch of CPU time, he completes his modifications and is prompted by the EDITOR for another command. Time Check: 112 Milliseconds.

And so on for the rest of the busy second. Each user gets CPU action for a slice of time. You probably noticed that only six of the 10 users had CPU attention. The Dispatcher determined that this specific load factor achieved the most efficient CPU use.

The total amount of work accomplished during this one second was 2,280,000 micro instructions in the central processor, 14 file accesses, seven input swaps, and five output swaps.

ONE SECOND IN THE LIFE OF A 3000 SERIES II.



Rapid switching of system resources, and concurrent CPU and I/O processor activity mean each user feels she/he has the total power of the HP3000 Series II on command. In this second from the life of a standard Series II, system overhead took only 12.5 percent. For more information check B on the reply card.

Advertisement

USER TESTED PERFORMANCE

Longs Drug Stores and Hughes accelerate Data Processsing with 3000 Series II

Hughes Aircraft Company's activities today span more than 80 major areas and include more than 550 products.

With the HP 3000 Series II, Hughes expands its ability to perform three functions: manufacturing business processing, and computer aided manufacturing and testing.

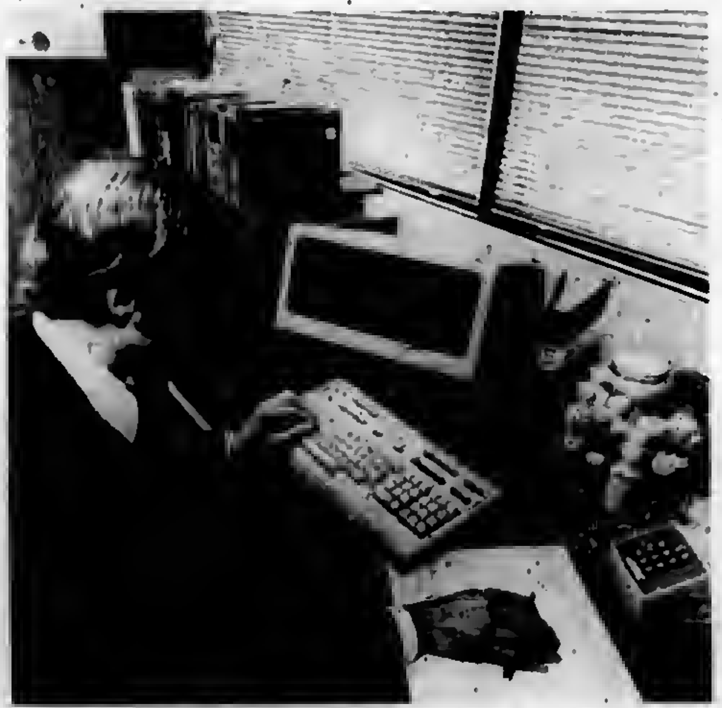
Hughes' Ground Systems Group typifies the technical sophistication and advances inherent in the Hughes' approach. New demands for computerization are continuous and diverse, making computer system flexibility essential. Hughes' Ground Systems Group's Manufacturing Division chose an HP 3000 as a machine that fit manufacturing business processing, as well as computerizing of manufacturing and testing processes of all their products. The 3000CX has the ability to serve these three functions simultaneously. Hughes' varied demands on the system created a perfect 3000 Series II test site. The new Series II, delivered on March 19, 1976 was operational within a day according to James Jones, Project Head in Computer-Aided-Test Systems (CAT).

CAT and Computer Aided Manufacturing (CAM) are in the development stage now. With over 4000 hours of programming work on the old 3000, Hughes was concerned about conversion to the new system, but these programs were simply transferred using the RESTORE utility. A few special cases did need to be compiled. Conversion was as simple as loading a mag tape.

Commenting on performance, Jones observed that the Series II was able to process a typical request from one of six test station satellites three times faster than HP's 3000CX. This same network also interfaces with two IBM 370's at the Corporate headquarters for processing financial and labor data.

Hughes estimates that 80 percent or better of their manufacturing processes will be automated Hughes anticipates throughput yields of double to triple today's standards. Key to that kind of performance is a consistently reliable and versatile general purpose computer like the 3000 Series II.

Longs Drug Stores have experienced fast growth and expanding computerization for the past ten years. Sales of the retail drug chain, headquartered in Walnut Creek, California, grew at a compounded rate of 22 percent reaching $410 million in the last fiscal year through 92 stores located in California and Hawaii. The result: a burgeoning increase in data processing work load, which Longs has chosen to meet with mini-computers rather than with the traditional large mainframes.



The HP 3000 Series II was operational at Longs Drugs Data Processing Center four hours after it came off the truck.

Longs has used a Hewlett-Packard 3000CX system as its main computer since 1974. Most data files are structured by HP's IMAGE Data Base System and are processed either with COBOL programs or IMAGE'S QUERY language. Batch processing is usually done during the night shifts with interactive terminal work assigned top priority during the day. Very heavy system use made Longs ideal for field testing of the new HP 3000 Series II.

According to Bill Gates, Longs Data Processing Manager, "We fully expected to encounter many problems with our Series II test system. After all, a main purpose of field testing is to discover any remaining bugs in the hardware or software. However, we found the system to be very reliable and stable from the beginning. As HP systems are factory integrated and tested prior to customer shipments, the Customer Engineers had it operational four hours after it came off the truck."

Longs performed many comparison tests between their HP 3000CX and the Series II, and now uses the new system for most of their production and development. According to Gates, the test results are significant: "We found the Series II executes our batch jobs 30 percent faster. We have also seen increased speed with our COBOL compilations. For example, three of these compiles take 98 minutes on the HP 3000CX. On the Series II, the execution time is only 37 minutes. Terminal response time has also shortened noticeably. The effect of additional main memory is that more terminal users and batch jobs may be added without degrading system performance.

"We have been using our test system very heavily", says Gates, "and have discovered only one software problem of any consequence, a bug in the printer spooling system's procedure to recover from a line printer paper jam. While this problem was being corrected by HP, we printed all special forms on our old system. This was an easy task since the two systems are fully software compatible."

Longs Drugs is convinced that at announcement the Series II is a solid, reliable system that sets a new standard for the industry.

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☐ A Series II Systems Summary
☐ B Series II Technical Summary
☐ C Series II Performance Summary

☐ **Please contact me**

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C-6-76

Little Learned From Booth's Death

Time to Accept Responsibility for Data Accuracy Here

...And in This Corner

By Kenniston W. Lord Jr.
Special to Computerworld

Nearly six months have passed since the unfortunate death of Frank Booth. Booth, you may recall, fell under a trooper's bullet when the trooper, operating with incorrect data, approached Booth's car, weapon in hand [CW, Dec. 10].

Despite the claim of Florida officials that the incident was a "one in a million" occurrence, you may also recall the incident was nearly repeated within a very short time span. The trooper was found not guilty, but what was the legacy purchased with Booth's life?

Kenniston W. Lord Jr., former president of the Society of Certified Data Processors, has been a frequent contributor to Computerworld; *this column marks his debut as a regular contributor.*

Lord welcomes all comments, suggestions and feedback on the issues raised.

Will others be protected against the storage of incorrect data? Will the potential for death because of incorrect data stored in a computer be diminished? Has Florida – or any state, for that matter – taken the steps to protect its citizens from those who would use the "letter of the file" in lieu of sound judgment? If any have, nobody knows.

It is however, reassuring to know the Federal Bureau of Investigation (FBI), through the National Crime Information Center (NCIC), has put forth an effort to overcome such errant data. In a recent communique to the states, it has now imposed upon the states the requirement to "send periodic letters" which will "certify" the accuracy of the data.

Thus it is now possible to be protected simply because the state in which you reside is willing to say you are, in fact, protected.

This is, of course, a step in the right direction – but for whom? The step appears merely to be an effort to exonerate the NCIC from any liability for death or injury resulting from the presence of state-supplied but incorrect data.

Who is protected? The FBI is protected. The Federal government is protected. The states are protected. By virtue of the ability to hide behind a rubber stamp, even the certifying state officials are protected.

Sadly, the only person not protected by this action is *you*.

The ability to "certify" state-held data, without any legal requirement to force the states to perform any tests of accuracy, is at once ludicrous, preposterous and quite possibly irresponsible. The process simply affords no protection while claiming to do so.

What should be included in such tests. To "certify" the data, should each state require a review by each of its data subjects? Should all data be verified before its use? Should there be an arbitrary ban on the use of data which is more than six months or a year old?

At what point does individual discretion about the use of data cease and legal regulation begin? What should that legal regulation include? Is it merely sufficient to say the data is perhaps 98% accurate so we'll be willing to sacrifice two people per 100?

In short, there is no clear-cut evidence the death of Frank Booth even rippled the consciences of computer people in our country, to say nothing of public officials. Unless such clear-cut evidence is forthcoming, and in very short order, one must conclude Frank Booth's death counted for nothing, even as his life counted for nothing, insofar as computers and computer people are concerned.

The lessons of Florida are clear: the existence of data is by itself harmless. It is only the injudicious use of such data which places the public in peril.

One has to wonder why the pages of *Computerworld* and other trade media have not chronicled the demonstrated indignation of computer people across the world. They have not, of course, because no such indignation has been expressed.

But the questions which remain are equally clear:. What is the right of an unsuspecting populace to be protected from the effects of inaccurate records and the misinterpretation of reporting of data? How many iterations of the Booth incident are required to cause the public to demand removal of personal data from data-handling devices?

Finally, when will our industry and the people who are employed in computer-related endeavors begin to accept the social responsibility to ensure not only that data about people is correct, but that it is properly used? The cloak of anonymity may well be disappearing.

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Reader Commentary

DP Fertile Field for Success in Art of 'Problemation'

By Louis Fried

Special to Computerworld

There is probably no art that has received more benign neglect than that known to its initiates as "problemation." Problemation is probably the oldest extant art and is devoted to the proper creation and nurture of problems.

Although its first practitioner was Eve, problemation is not an exclusively feminine art. Adam followed closely after her.

Some of the most famous people in history have shown a remarkable aptitude for practicing problemation on a grand scale. A few outstanding examples are Marie Antoinette saying "let them eat cake", Napolean invading Russia, Neville ("Peace in Our Time") Chamberlain appeasing Hitler at Munich, Mrs. Murphy (whose lantern in the cow stall started the Chicago fire), Herbert Hoover saying "prosperity is just around the corner" and Richard Nixon recording his conversations for posterity.

It should be noted the dominant theme of these examples is the planning that went into the creation of these problems (excluding, of course, Mrs. Murphy). In fact, this illustrates the two major branches of problemation: the "planned" or conscious approach and the "inadvertent" or unconscious approach.

Planning for Problems

By far the most successful problems are planned. With the benefits of modern technology, the most fertile field in the history of mankind has been developed – the computer data processing field.

This field provides the serendipitous combination of immense opportunity with careful detailed planning. As a result of DP during the last 10 years, never have so few done so much to so many. And the future holds even more promise.

The planned approach is usually most evident on major projects. It requires the use of the best available planning tolls with careful attention to ignoring a few key facts.

This is essential and, with careful training, even a novice can detect the appropriate key facts that should be considered inconsequential.

For example, a dollar amount field can be designed for three digits because "only" .5% of the transactions exceed $999. A validation table can be built into a program, since it "only" changes two or three times a year. A program to maintain an archive file doesn't need to provide the ability to delete records because that "hardly ever happens."

Some 'Classics'

A few "classics" in the field are somehow constantly repeated are illustrated by the following quotations (those who uttered them shall remain anonymous):

- "We can save one more character in the record by using only one position for the year indication."
- "Our on-line system has an unbreakable security method to protect your files and programs."
- "This program modification is so slight that it doesn't have to be tested."
- "At this point in the schedule the hardware should be delivered because all the software will be completed."
- "This project will cost $474,095 and be completed by July 30."

The inadvertent approach to problem creation relies primarily on the subconscious. It must, therefore, be discussed in psychological terms.

The simplest way to excel in this method is through active self-improvement directed toward the development of an overweening ego. (A weening ego alone is not enough).

This places one in the enviable position of knowing that one is always right and makes it easier to ignore the questions raised or facts presented by others.

Further, the inadvertent approach is conducive to exceeding authority and taking unnecessary or unjustifiable risks. It can contribute to a mastery of obtuse personnel management practices.

A hair-trigger defensive reaction can be a big help. Cultivation of this attribute can quickly lead to a situation where one will not be bothered by anyone else venturing an opinion or offering contradictory facts.

A more complex approach is the result of hidden anxiety or guilt feelings that permit the subconscious to set traps. Oversights or errors are the product of the subconscious trying to punish the conscious.

This is actually a happy circumstance because it allows the problem creator to operate with the best of intentions. This method is so common that the technical term "schlemiel" has been developed to identify the syndrome.

The beauty of the inadvertent approach lies in the ease with which the blame for problems can be rationalized as being someone else's fault. Of course, its drawback is that even the most skilled practitioner cannot take credit for the problems he has created.

Measuring Success

Success in the field of problemation is inversely related to "success" as it is measured by the conventional arts and sciences. However, the ultimate in success is the ability to rise high enough in the conventional world to make the final problem one of tremendous impact.

Napolean, Chamberlain and Nixon are great figures in the history of problemation because they had the tenacity to achieve that one great problem.

Dextrous application of the art of problemation can lead to the fuller life containing the kinds of misadventures one dreamed about in childhood, but which are rarely achieved as an adult.

Remember in the field of problemation there is no substitute for doing it yourself. And with the aid of modern computer technology, the horizons for accomplishment are unlimited.

Fried is manager of corporate management information systems for Ampex Corp. in Redwood City, Calif.

Letters to the Editor

Asterisks Help Control Name-Suffix Blunders

The May 10 Taylor Report on name-suffix blunders and comma control outlined system methodology similar to that used by my firm. We use a control method based on asterisks.

A single asterisk is required following the title and preceding the last name. This is followed by asterisk, first name, asterisk, middle initial and asterisk.

For example, Mr. Nathan W. Louis would be inputted as: Mr.*Louis*Nathan*W*. If Mr. Louis was a Certified Public Accountant, input would be: Mr. *Louis*CPA*Nathan*W*.

The string transposition assumes that the entire last name follows the first asterisk and ends as of the first blank character or the second asterisk, whichever occurs first.

Our name control system is based on the concept that a maximum of four asterisks would be inputted. Consequently, Liberace would be keyed as *Liberace*** and Capt. Robert A.G. Jackson As Capt. *Jackson*Robert*AG*.

Harvey R. Weisthal
Systems Analyst

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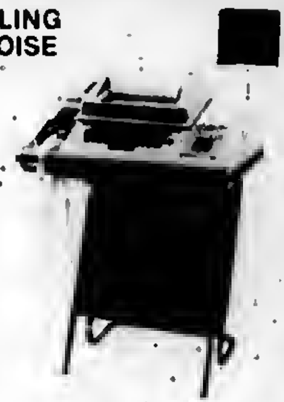

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Letters to the Editor

Revision of FCRA Needed To Prevent Privacy Abuse

I must take issue with the interpretation of the Fair Credit Reporting Act (FCRA) given by J.V. White, president of the Credit Buresu, Inc. in Atlanta, Ga. [CW, April 5]. He stated that the FCRA limits the conditions under which a credit report may be issued to a governmental agency.

I am sorry to report that his industry was successful in making sure that the limits as stated in the law were effectively empty.

To quote from the law: "A consumer reporting agency may furnish s consumer report under the following conditions and no other:

(1) In response to court order.

(2) In accordance with the written instructions of the consumer to whom it relates.

(3) To a person which it has reason to believe, for credit, for employment, for insurance, for a license or otherwise has a legitimate business need for the information in connection with a business transaction involving the consumer.

"Notwithstanding the provisions of Section 604, a consumer reporting egency may furnish identifying information respecting any consumer, limited to his name, address, places of employment or former places of employment, to a governmental agency [for any purpose and without the knowledge of the consumer on whom the informstion pertains]."

While some terms in the law are open to interpretation (such as "business need"), it would seem to me that the government's hands are not tied if they want to get information on an individual.

I found White's position to be particularly noble, but the potential for abuse of individual rights of privacy and due process (including the right to advance notice of any nonroutine disclosure) is sufficiently great to warrant a revision of the FCRA and extension to other private-sector industries.

Gordon C. Everest
Minneapolis, Minn.

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PRIVACY, SECURITY, AND THE INFORMATION PROCESSING INDUSTRY

A Report of the Ombudsmen Committae on Privacy, Los Angalas Chaptar, ACM, Dehi A. Gerberick, Chairmen. March, 1976. 200 pages.

The raport prasants a sat of guidelines for implementing the privacy/security recommendations in currently publishad studies, including edministrative, technological and legal consideretions.

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ACM is the sole source in North Amarica for this Raport of the CODASYL Systems Committee. Merch, 1976. 276 pagas.

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C-6

Ignoring Defaults Means Choices Made Randomly by System

(Continued from Page 25)

only temporary.

However, whether I buy the reason or not is irrelevent. The information supplied, even if wrong, appeared from the form to be supplied as an act of courtesy, nothing more.

Nothing is said regarding possible reviews of the decision or action to be taken to reverse it — except the implied invitation to go to the FTC if it is believed there is discrimination involved.

Of course, some of the information may be just an act of courtesy. I really haven't kept up with the legal requirements in this area. But some of it, I am sure, was given in compliance with various state and federal laws, etc.

And here again, the legal system has fallen down, because it does not indicate what should be done if the information itself or its use is challenged. By default, perhaps, it was implied that we should go to the address printed on the top, but no information was given as to how it should be done or with what prospects of success.

Computer Defaults

All of this may seem far removed from computers and computer systems. Yet, in this easily understandable example, the complexity of all default systems is apparent, as also is the way in which abuses can continue after apparently being cured.

The continuation of abuses in computer systems in the Automated Decision Making Application areas has recently been shown by the General Accounting Office (GAO) [CW, May 17]. What was not shown in its report was the complexity of any default systems involved in really preventing the continuation of abuses.

It was with this in mind, the understanding of the default systems, that this report was written. Unless default complexity is appreciated, the actions taken to halt abuses are liable to end up perpetuating the same or other abuses.

Running Automated Decision Making Applications in the absence of carefully thought-out, documented and flexible default systems protecting the integrity of the decision-making application itself is a risky business, as GAO has just told us.

Until we have such controlled default systems, the quality of applications probably will not drastically improve, any more than the quality of software transferability did before we got controlled default hardware systems over 10 years ago. But, when we do get there, watch out as computers really get better quickly!

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'ISP' Uses Shared DASDs to Balance Multiple 370s

By Don Leavitt
Of the CW Staff

LONG BEACH, Calif. – The Intersystem Spooling Processor (ISP) package from Tone Software Corp. resolves the problem in which multiple IBM 370s running under VS1 share disk storage and other resources but are unable to communicate and therefore cannot effectively share the work, the vendor said.

The software can support two to 36 CPUs concurrently and work with any 370-compatible peripheral devices except diskettes, a spokesman claimed.

ISP enables CPUs to transfer job control and both input and output from one CPU to any other in the configuration if both share the same direct access storage devices (DASD), Tone said.

Normally jobs are processed within the CPU in which they are entered; with ISP, however, the user may alter jobstream control parameters to send a job to a specific CPU if, for example, it has particular peripherals that must be used, the spokesman said.

Without that change, ISP will send the job wherever it can be processed first, he added.

The user can now pool card reader/punch and printer resources to avoid duplication of equipment and to run those utility operations on the CPU that will give the most efficient spool processing, Tone said.

'Significant' Space Savings

Transmission of output data to subsequent CPUs is implemented using the shared DASDs with redundant data compression, the vendor noted.

This offers a "significant" space saving – "approximately 38%" – compared with the IBM-supported Job Entry System (JES) spool, Tone claimed.

Meanwhile, pooling of I/O on one CPU allows JES to optimize the use of the available peripherals, and overall turnaround time "may be substantially reduced," the independent added.

Other ISP features include the ability of a running batch job to "release" a subsequent job, the ability to have finished steps made available for printing prior to job termination and the ability to "submit" another job based on conditions sensed during processing, Tone said.

The software system was designed to operate under Release 3.0 and later versions of IBM's VS1. Approximately 250 tracks of shared DASD space are required for every 1,000 pages of spooled data, the spokesman said.

The main storage requirement is dependent on the function of the CPU. Approximately 8,200 bytes of virtual storage are required for each system sending output; about 2K is needed by the CPU controlling the unit record peripherals.

Operating speed depends on the CPU and its peripherals, Tone added.

While ISP may be used in conjunction with Tone's terminal support software, it was designed for stand-alone operation, the spokesman emphasized.

ISP is expected to be available July 1 for a one-time license fee of $11,500. Alternatively, it can be acquired on a 12-month paid-up lease arrangement for $1,150/mo, Tone said.

The firm can be reached at P.O. Box 1127, 4549 E. Anaheim St., Long Beach, Calif. 90801.

'Sara-H' Supports Measurement, Tuning, Billing of HIS Systems

FALLS CHURCH, Va. – Easy accessibility to a small number of management indicators which describe both system operation and useful production was the chief design goal of the Systems Analysis and Resources Accounting for Honeywell (Sara-H) package, according to its vendor, Boeing Computer Services, Inc. (BCS).

A rewrite of the original Sara for IBM sites, Sara-H is intended for use with large-scale Honeywell Information Systems (HIS) CPUs. It uses the Gcos-generated Statistical Collection File (SCF) as input, BCS said.

Output may be selected from a range of available reports, but the most significant figures are what BCS has named Resources Utilization Time (RUT) and Computer Resource Units (CRU).

RUT is an estimate of the stand-alone running time of an activity while a CRU is a measure of the system capacity demanded by an activity, BCS said.

The CRU has been designed to be repeatable – if the same activity is executed several times, the same CRU value should be obtained, BCS explained.

By doing this, the CRU can be used for billing by associating a dollar value with it, a spokesman added.

These management indicators provide a measure of multiprogramming level on the one hand and of job lengthening due to multiprogramming on the other, he said.

They also indicate the effectiveness and efficiency of a computer system as a function of a base configuration and workload requirements, he added.

No Special Overhead

The use of Sara-H adds no special overhead to the processing of an installation's normal workload, BCS said; the only data used is from the accounting data file regularly collected by the system, and Sara-H runs as an application program, the company noted.

The reports produced include data on individual device usage by processing period; resource levels required by individual major system components; and analysis of Time Sharing System (TSS) operations on the session and aubsystem level.

Sara-H can be used on any HIS system utilizing Gcos as its operating environment. It is available in executable object code form for $10,000, but installation support and training may add as much as $5,000 more to that figure, BCS said.

The package is being marketed by the Space and Military Applications Division of BCS at Suite 217, 7777 Leesburg Pike, Falls Church, Va. 22043.

'Belatrix' Eases DG Edit Jobs

CHATTANOOGA, Tenn. – Described by a user as "more powerful than any editor available from Data General [DG]," Belatrix, a multiple-user interactive text editor and source program maintenance program, is now available from Greg Hullender, the developer.

The Hullender software runs on any DG system that functions under RDOS, supporting as many as 32 simultaneous terminal users in 64K of memory. It can be used with less memory, but response time would degrade if the full potential user load was active in the smaller environment at the same time, a spokesman said.

Full Bag of Tricka

The package includes features such as macro commands, facilities to search for strings of characters and other capabilities necessary for editing source programs, JCL procedure streams, data or text files, he added.

"Unlike anything DG has," Belatrix allows editing to proceed simultaneously on programs written in Assembler, Fortran, Algol, Cobol "or any other language which uses a source file." There is no degradation if more than one user works with the same language, the spokesman noted.

Text editing, also provided by Belatrix, is based largely on the character string manipulation facilities that support source program maintenance. Letters, parts lists, catalogs and similar documents that need frequent or periodic updating could usefully be handled with this facility, Hullender said.

In operation, Belatrix moves a copy of previously stored text or source code into a work area where the user is free to make changes without damaging the original; once the editing is complete, the revised copy is put back on file, he explained.

Written in Basic, the editor is available on punched paper tape for $300, Hullender said from 456 S. Crest Road, Chattanooga, Tenn. 37401.

RSTS/E-Based PDP-11 Gains DBMS Features Through 'Data Boss'

N. MIAMI, Fla. – Data Boss from Florida Computer, Inc. (FCI) is a generalized data base management system (DBMS) currently implemented on Digital Equipment Corp. PDP-11s under RSTS/E which meets "the majority" of Codasyl standards, according to the vendor.

The system includes an English-like inquiry language and supports multiple data bases with unlimited multiple concurrent accesses of the same data base, FCI said. On the other hand, Data Boss also includes multilevel password protection, a spokesman added.

Changes and additions to data base fields can be handled easily, the spokesman said. The system provides support for hierarchical, network, inverted, random, indexed sequential, sequential and relational approaches to data base design, he continued.

Application programs used under Data Base are typically written in Basic Plus, the standard language for RSTS/E. Once under the DBMS control, they are retrieved and executed through use of an applications monitor subsystem.

The monitor, called the Data Boss Manager, controls the steps, operations and options a user accesses. It forces the user to identify the step or overall application before specifying the desired operation and then the particular type of problem to be solved by the selected operation, FCI said.

For the beginning user, the Manager can display a menu of possible choices at each level of definition, printing out whatever is selected before going on to the next level.

The experienced user can bypass the menus but still have the step, operation and option identified in words by entering three parameters separated by commas in response to the first inquiry from the Manager, FCI noted.

Since RSTS/E requires 24K words and Basic Plus another 14K, FCI recommended a 64-K-word PDP-11 aa the minimum configuration for Data Boss use.

The DBMS is available along with a set of utility programs, for $10,000 from the vendor at Suite 122, 99 N.W. 183rd St., N. Miami, Fla. 33169.

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Sycor Adds Cobol

ANN ARBOR, Mich. – A Cobol compiler system providing a subset of ANS Cobol '74 has been developed by Sycor, Inc. for its Series 440 clustered terminal system.

Expected to be used for work to be run in background mode, it will not replace the Terminal Application Language (TAL) as the means of coding data entry and other foregound operations, Sycor noted.

Marking the first time Cobol has been available for Sycor equipment, the compiler supports sequential, direct and indexed sequential files. It also allows segmentation of programs for execution in limited memory, Sycor said.

Scheduled for first deliveries in July, the compiler will be distributed free to Sycor 440 users, the company noted from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Package Backs Data Bases on PDP-11

CINCINNATI – The IIS Transaction Processing System (IIS/TPS) expected from Interative Information Systems (IIS) early this summer was designed to support development and use of data base applications on Digital Equipment Corp. PDP-11s.

The system runs under DEC's RSTS/E environment and can support up to 32 simultaneous terminal users; each user can access and update an on-line data base of up to 128 related files, IIS claimed.

In addition to a data base management system described as a "Codasyl subset," IIS/TPS includes the Interactive Systems Language (ISL) which was designed specifically for interactive transaction processing. It is said to be "significantly easier" to understand and use than Cobol or Fortran.

Several subsystems are built into IIS/TPS. The Transaction Dispatching System enables non-DP users to work with IIS/TPS "without having to know or understand anything but their transaction codes and password," a spokesman commented.

The Data Logging System keeps track of data base updates. It also accumulates and makes available utilization and billing information for use in tuning IIS/TPS and for charging users according to resources used, he added.

The Operator Service Facility manages all operator communication and keeps a journal of all messages sent to any system operator, the vendor said.

IIS/TPS runs as an application program under RSTS/E; other time-sharing tasks can therefore be run concurrently with the transaction-processing operations, according to IIS.

The entire IIS/TPS package will be available July 1 for a one-time charge of $15,000. Each subsystem will be available separately, the firm indicated, but individual prices have not been announced.

IIS can be reached through P.O. Box 37403, Cincinnati, Ohio 45222.

Medical Accounting Supported

N. HOLLYWOOD, Calif. – The Professional Office Management System Version II (Poms-II) from Occidental Computer Systems, Inc. (OCS) supports 360/370 OS-based in-house centers, service bureaus and other users concerned with health-care accounting, according to the vendor.

Enhancements include support for the preparation of the American Medical Association (AMA) insurance form, acceptance of input from Touch-Tone devices or Sycor terminals and reworking of some of the internal operations of the original package, OCS said.

Poms-II was designed to process several different organizations in a single run through the use of "profile" or control cards which tailor the processing to each organization's requirements in turn.

The package provides patient billing and accounts receivable support as well as generating "all of the required insurance forms" for the medical office, the firm said.

In addition to providing for the "universal" claim form recently approved by AMA, Poms-II is said to accommodate the tape-to-tape claims procedures already in use by several insurance carriers.

The file structure of Poms-II accommodates the coding structures for RVS procedure and ICDA diagnostic codes. It is also flexible enough to allow for future Professional Service Review Organization and National Health Insurance requirements, the vendor claimed.

The package supports input from IBM 1001 and compatible 10-key numeric entry pads as well as data from keypunch, Entrex key-to-disk, Sycor, Datapoint and Texas Instruments remote terminals.

Written in ANS Cobol and delivered in source code with JCL, test data and manuals, the system runs in an 80K region under OS. It is available for $24,600, the firm added from 10202 Riverside Drive, N. Hollywood, Calif. 91602.

Intel 8080 Assemblies Eased

RESTON, Va. – A resident assembler developed by Microcomputer Techniques, Inc. (MTI) for Intel's 8080-based System Design Kit (SDK) microcomputer includes full compatibility with existing assemblers; relocatable object code; and one-, two- or three-pass operation, MTI said.

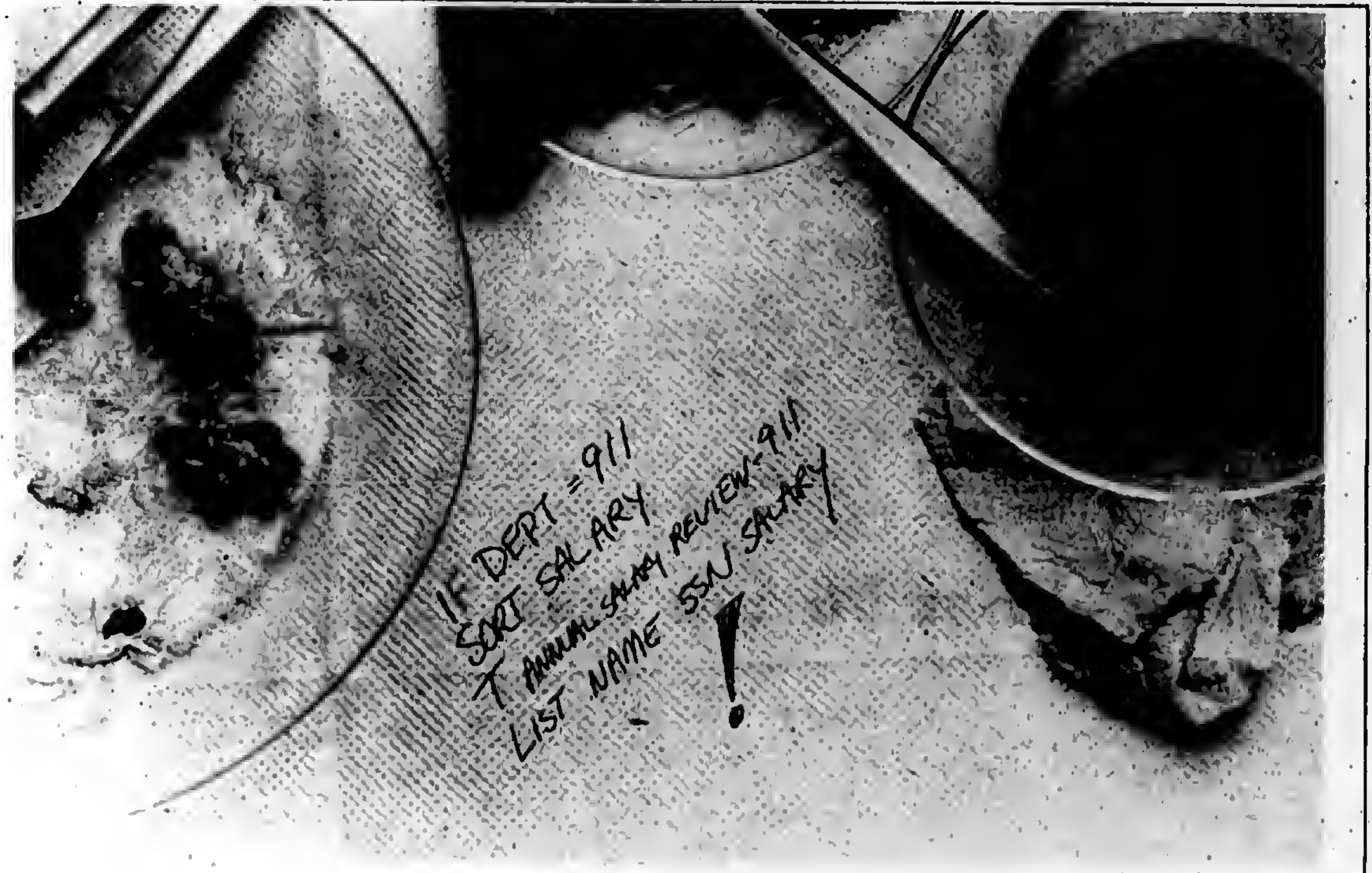
The assembler occupies less than 4K bytes of storage and the object code it produces can be run on any 8080-based microcomputer, according to the vendor.

The assembler is available from stock on four preprogrammed programmable read-only memory (Prom) chips for $450 MTI said, from 1120 Reston International Center Office Building, Reston, Va. 22091.

Correction

Although data compression is a goal of many installations, the *Computerworld* Special Report did not mean to "compress" Maj. Richard Ensign's "10-Verb Language" [CW, April 26] to just nine verbs. The following should have been part of the language:

- *Compute.* A requirement to calculate the result of data elements being entered into a formula or equation when both the data and the formula have been either input or retrieved. (Normally, computation is the result of a locally programmed application program.)



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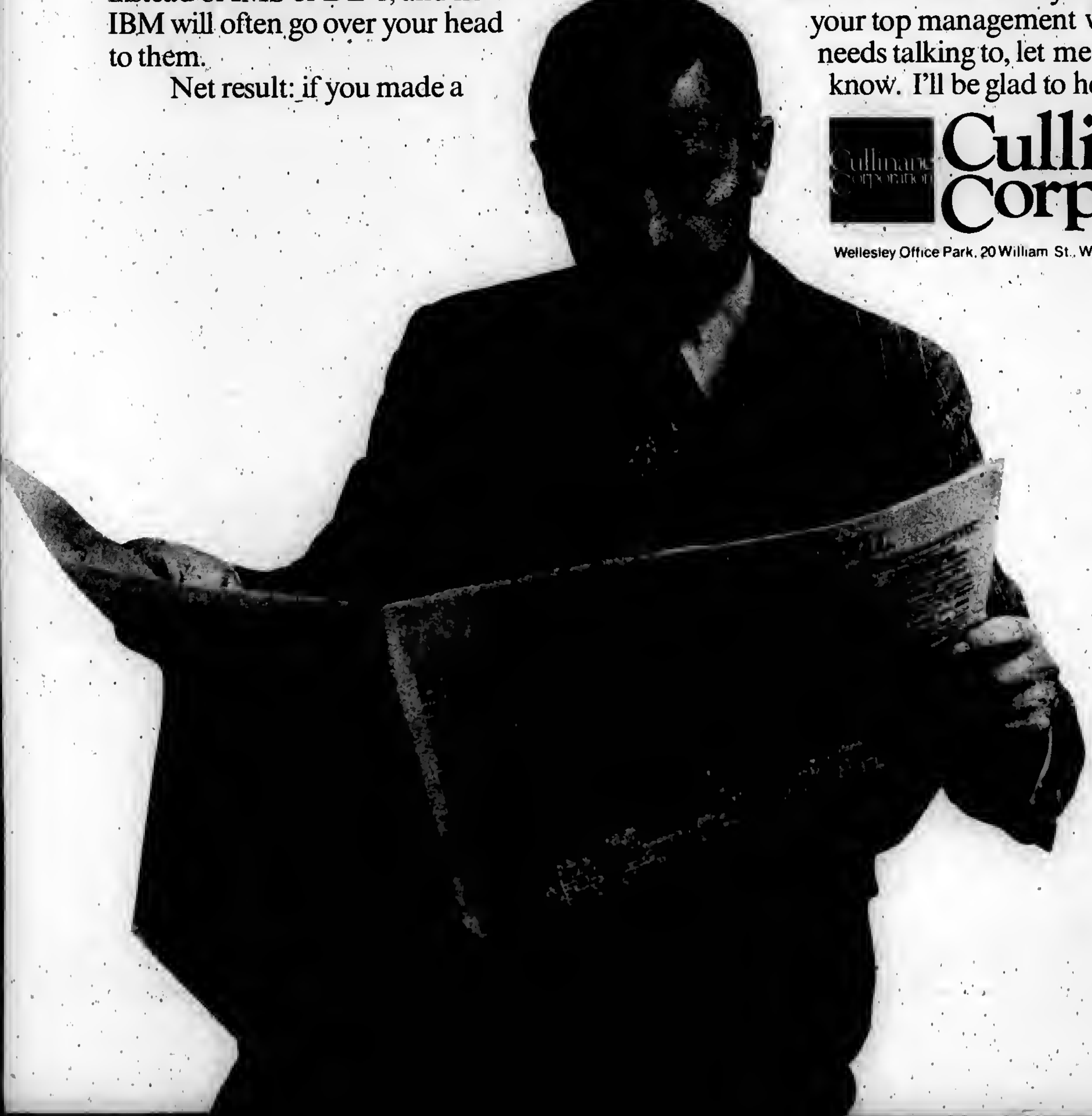

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New Verb or PERFORM Change Proposed

By Patrick V. Reese
And Susan J. LeVine
Special to Computerworld

In trying to utilize structured programming, the PERFORM UNTIL can adequately be utilized to implement the DOWHILE and DOUNTIL control structures, but occasionally the mere modification of the identifier or index until a condition is met is all the processing required.

With the current version of the PERFORM verb, a dummy paragraph must be coded, and the compiler must generate a branch and return using that paragraph name.

When the program is running, this extraneous branching must be accomplished subsequent to each test of the condition.

Please consider the following coding example:

```
PERFORM EXIT-PARAGRAPH
  VARYING IDX1 FROM IDX2 BY -1
   UNTIL TABLE-ENTRY (IDX1) =
   TABLE-ENTRY (IDX2) or IDX1 = +1
EXIT-PARAGRAPH.
 EXIT.
```

Two solutions seem apparent: The first would be to modify Format-4 of the PERFORM verb, allowing a new reserve word, NULL, as procedure-name-1. The compiler would recognize NULL and not generate the linkage to another paragraph.

The second solution would be to implement a new verb, VARY, whose syntax would follow the same rules as the VARYING option of the PERFORM verb.

Written as a letter to Codasyl's Programming Language Committee, which is responsible for the definition of Cobol, the accompanying article was also sent to Computerworld *by the authors who seek the opinions of other users on the changes they have proposed.*

The original coding example would then be implemented as follows:

Modified PERFORM:

```
PERFORM NULL
  VARYING IDX1 FROM IDX2 BY -1
   UNTIL TABLE-ENTRY (IDSX1) =
   TABLE-ENTRY (IDX2) or IDX1 = +1.
```

VARY Implementation:

```
VARY IDX1 FROM IDX2 BY -1
 UNTIL TABLE-ENTRY (IDX1) =
 TABLE-ENTRY (IDX2) or IDX1 = +1.
```

Reece is systems and programming manager and LeVine is a programmer at the Indiana Employment Security Division in Indianapolis, Ind.

IMS/360 Functions Under OS/VS With 'Hybrid' Package Support

SUNNYVALE, Calif. — A "hybrid" version of Control/IMS, a transaction accounting and performance reporting system, is now available from Boole & Babbage, Inc. (B&B) to support the use of IBM's IMS/360 in a virtual storage environment.

Normally, IMS/360 is used in a "real" environment under OS/360-370, and the newer IMS/VS is used with OS/VS. With the "hybrid" support, users can now convert from one operating system to another without having to convert data base applications simultaneously, B&B said.

While IMS accumulates some usage statistics, Control/IMS collects additional information and prepares tabular and graphic formats highlighting trends, growth patterns and saturation levels, the vendor said.

The software also accumulates data that can become the basis of chargebacks to end users, the spokesman noted.

Control/IMS is available under a perpetual license for $17,000 per site. Once one version is installed, others — the "hybrid" or the VS one, for example, if the first was for the "real" environment — can be acquired for just a maintenance fee.

B&B is at 850 Stewart Drive, Sunnyvale, Calif. 94086.

Itel Offering Support On-Line in California

SAN FRANCISCO — Distributors, wholesalers and manufacturers in Northern California can have turnkey, on-line support for accounts receivable, inventory control and accounts payable through the facilities of Itel Corp's Data Services Group.

Typical users might be companies that have installed or are considering small business systems, but which don't want to make the commitment in staffing required by an in-house operation, an Itel spokesman said.

These applications areas can be used in conjunction with batch payroll and general ledger processing which is currently available in the San Francisco Bay area, he added.

Serviced from an office at 750 E. 14th St., Oakland, the northern California users will in fact be linked to the Data Services Group's main computer center at 3 Corporate Park Drive, White Plains, N.Y. 10604.

Rapidata Adds Graphics To Network Capabilities

FAIRFIELD, N.J. — Rapidata, Inc.'s Probe Graphics facility is described as a means of preparing "many kinds of time graphs and cross-section scatter diagrams, including line graphs, bar graphs and histograms" on terminals, plotters or plotting terminals.

The firm's remote-computing services are headquartered at 20 New Dutch Lane, Fairfield, N.J. 07006.

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Few Gaps in Range of DP-Related Self-Study Courses

J. Daniel Couger On Education

The 9th annual *Guide to Audio/Visual Instruction in Data Processing*, released recently by the University of Colorado, reveals few gaps in the array of multimedia materials for self-study in data processing. Granted, there remains a shortage of materials for some highly specialized areas, such as design specification languages and microcomputers, but for each of the basic instructional areas the training director now has a choice of a variety of materials.

Advanced Systems, Inc. (ASI), Deltak and Edutronics – the big three vendors in audiovisual (A/V) courses – continue to widen the gap between themselves and their competitors. The computer vendors are not producing A/V courses at anywhere near the volume of any of these companies, although Honeywell has released an excellent course on IDS, its data base management system.

Dave Cook, Honeywell's manager of education services, said many of his company's earlier courses have been updated during this past year.

The American Management Association has just released a multimedia course, "Using the Computer as a Management Tool." According to Fred Voss, director of management education systems, the course objective is twofold: to provide managers with an understanding of and a practical procedure for obtaining needed information and to improve communications between managers and DP personnel.

Rohit Patel, vice-president of product development, said 12 new courses were added to ASI's product line in the past year, including the structured programming series.

Deltak Courses

Notable among the new Deltak products are IBM 3 and System 32 courses. Larry Constantine and Ed Yourdan were instrumental in the structured design course.

Pat Sorrentino, Edutronics' vice-president for product development, indicated that firm will be releasing courses on CICS/VS, the IBM 3 and VS dumps this year.

Edutronics' new structured programming course consists of six modules, each 12 to 17 minutes in duration. The course was developed with the assistance of Prof. Gerald Weinberg, a well-known authority in the field.

A slide presentation on electronic funds transfer (EFT) systems is now available from the American Bankers Association. The course covers the purpose, the implementation approach, potential benefits and problem areas of EFT systems.

Vendors Entering the Field

Another entry to the education field is Info 3; an organization which emphasizes IBM 3-oriented products. At present the company has three courses: Duos, intended for the DP manager or system analyst, teaches the principles of system development; the Automatic Report Feature (ARF) course, an RPG-II course designed for system analysts and programmers; and, Raptap RPG-II, an advanced course on programming techniques and array processing.

Management Controls Corp. (MCC) is another new vendor in the field of self-study courses. MCC has a six-unit course, each consisting of a 30-minute audio tape and workbook.

Digital Equipment Corp. has produced four self-study courses on ANS Cobol, introduction to data communication concepts, introduction to minicomputers and introduction to the PDP-11.

IBM has expanded its VS series of courses to include CICS. It also has a material requirements planning video course.

The *Ninth Annual Guide to A/V Instruction in Data Processing* lists the products of each of the suppliers of A/V materials. For a copy, send $4 ($5 if you require an invoice) to A/V Guide, University of Colorado, Cragmor Road, Colorado Springs, Colo. 80907.

Couger is professor of computer and management science at the University of Colorado.

Maritime Data Base Installed on GE Net

STAMFORD, Conn. – Designed to provide businesses and government organizations in marine transportation with on-line access to data needed for problem evaluation and decision making, the Marine Information System has been inaugurated by Marine Management Systems, Inc. (MMS).

Installed on the General Electric (GE) remote-computing network, the system is available around the clock to subscribers with teletypewriters or CRT terminals in and near the major maritime centers in North and South America, Europe, Australia and the Far East, MMS said.

Data supplied by the Marine Information System is only that classified as "public information," a spokesman noted. Included is technical information about "every commercial vessel in the world over 4,000 gross tons," daily charter fixtures, tanker casualties and other data, he added.

Participating in the implementation of the system are the American Bureau of Shipping, Lloyd's Registry of Shipping and Det Norske Veritas, all of which will be maintaining ship data for the system.

Requests for searches of the data base can be triggered from any subscriber terminal and may be shaped by whatever parameters the user defines or redefines to meet his needs.

An average per-use service charge – including the cost of the network resources – can range from $2.50 to approximately $30, depending on the compexity of the search and the subscriber's arrangements with MMS.

These arrangements may call for a substantial annual subsciption fee with lower per-use charges for heavy users or a minimal yearly fee with higher per-use costs for less frequent users. Annual fees, therefore, may range from $2,500 to $200, MMS said from 300 Broad St., Stamford, Conn. 06901.

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Operating in the 3211 mode, the DOC 2250 prints 10% faster than the 3211. The DOC 2250 costs less than half as much as the 3211. The DOC 2250's integrated microprocessor controller eliminates the need for a separate controller. And because the DOC 2250 has built-in, comprehensive microdiagnostics, maintenance can be done off-line without tying up the host system.

The DOC 2250 also offers: buffered vertical format control; fully-buffered print line; operator-changeable character arrays; Universal Character Set Buffer (UCSB); up to 6-part forms; paper slew up to 100 inches per second; power cover; power stacker.

The DOC 1800 offers all the features of the DOC 2250, but at a reduced printing speed. And a reduced price.

The 1403 compatibility feature allows both models to operate in the 1403 mode. Your CPU will think it's working with a 1403. You'll know you're getting a 2250 or 1800 lpm printer for just about the cost of an 1100 lpm printer.

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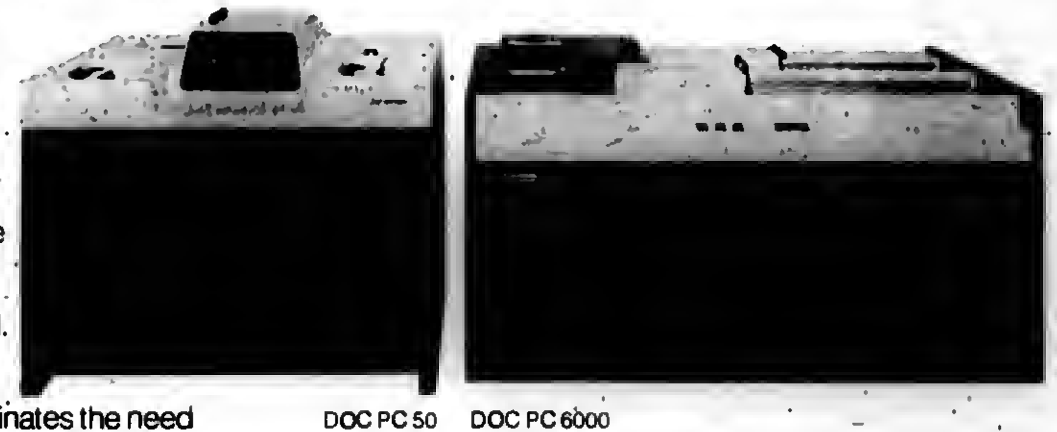

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Summer Confabs Key on Software

WASHINGTON, D.C. – Washington will be the setting for two separate conferences on software this summer; one in late June and the other a month later in July.

The Software Management Conference – at the Crystal City Marriott on June 21 and 22 – is sponsored by the Los Angeles section of the American Institute of Aeronautics & Astronautics, in cooperation with the Association for Computing Machinery (ACM) and the IEEE Computer Society.

This meeting will serve, according to the sponsors, as a forum to define both the state-of-the-art in software management and the formulation and implementation of the Department of Defense (DOD) software management "initiatives."

Directive Discussion

Specifically, DOD's plans covering system software acquisition, management, coordination and control will be defined and detailed. DOD Directive 5000.XX "Management of Computer Resources in Major Defense Systems" will be discussed and copies distributed at the conference, the sponsors added.

Registration fees range from $195 for general admission to $180 for sponsoring group members to $160 for federal, military and university personnel. Requests for information should be addressed to AIAA, Department S, 444 W. Ocean Blvd., Suite 1403, Long Beach, Calif. 90802.

In July, a three-day conference at the Twin Bridges Marriott will be somewhat less government-oriented. Titled simply "Software," it will consider technology, development, procurement and project management and focus particularly on quality, cost, security and personnel, according to the sponsoring American Institute of Industrial Engineers (AIIE).

Speakers will include Harlan Mills of IBM's Federal Systems Division, Theodore D. Puckorius, commissioner of automated data and telecommunictions service for the General Services Administration; and John Bennett, president of Applied Data Research, Inc.

Hopper, Welke And Bauer

Capt. Grace Hopper, U.S. Navy; Larry Welke, publisher of the *ICP Software Directory*; and Walter F. Bauer, president of Informatics, Inc. are also on the agenda, as are numerous technical sessions.

Planned for July 19-21, this meeting costs $295 for general admission and $265 for AIIE members, but team discounts apply if three or more people register from the same organization.

More information about this conference is available from Department SW1976TB, AIIE Seminars, P.O. Box 25116, Los Angeles, Calif. 90025.

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FCC Halts MPL For Three Months

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has suspended for three months the proposed AT&T private line rate structured known as the Multi-Schedule Private Line (MPL) [CW, April 26].

The MPL rates were proposed by AT&T as a replacement for the existing Hi/Lo private line tariff which the FCC had earlier ruled was unjustified and discriminatory.

Under MPL, private line rates would have been based on a point-to-point pricing formula. The Hi/Lo rates, which are more complicated, require users to calculate per-mile charges based on homing points and other variables.

In suspending the MPL proposal, the commission said "substantial questions had been raised concerning the lawfulness" of the AT&T rates.

If it had taken effect, the MPL tariff would have raised rates for 15,314 users, decreased rates for 4,134 customers and left rates about the same for 727 private line subscribers, according to AT&T.

The greatest increases would have been felt by interstate users who operate at distances of less than 25 miles.

In addition to suspending the MPL tariff, the FCC ordered an investigation into the justification for the rates. This inquiry will be based on whether the proposed charges are "unjust, unreasonable or discriminatory; whether the charges conform with previous decisions relating to the relationship of AT&T with the specialized common carriers; and whether they comply with other existing FCC regulations," the commission said.

The FCC ordered AT&T to retain the Hi/Lo rates during the three-month suspension period and keep accurate accounting so refunds can be made to users if that is found to be desirable when the tariff investigation is concluded.

The Hi/Lo rates charge less for heavily used routes between major cities while the more rural routes cost users more money each month. These rates were AT&T's response to the emergence of the specialized carrier competition, most of which occurred along the more populous or "hi-density" routes.

The commission did not agree, however, and said the Hi/Lo rates were discriminatory. The MPL rates were filed as a response to an FCC order that AT&T reprice its private line tariff according to FCC guidelines.

First Node Implemented

Data Net Optimizing Records Retrieval

By John P. Hebert
Of the CW Staff

ATLANTA – A records retrieval company here serving the insurance and other industries got a jump on its future when it examined the advantages of computerized data communications over two years ago.

Realizing then that a communications network would eventually be a "necessity," Dataflow Systems planned and recently installed the first phase of a nationwide network, according to Harry V. Hewey, the company's director of systems development.

Two major reasons prompted Dataflow to take this initiative: first, the network would be needed to achieve a reduced turnaround time in accessing motor vehicle records to qualify applicants for auto insurance policies and, just as important, it would enable Dataflow to handle expanding markets, Hewey said.

"In insurance, having the network to retrieve each sate's Department of Motor Vehicle (DMV) records means a customer using the Dataflow service can write a policy and take immediate action on that decision," he said.

Pacific Region First

The first phase of the company's network handles the Pacific region – a 10-state area where half of the state's DMVs are fully or partially automated.

Fully operational since early May, the Pacific node has accomplished its objectives. It is experiencing a 24-hour turnaround time for processing drivers' DMV records and accomplishing immediate retrieval and verification of drivers' records in states where the DMV is automated, according to the system's developer and installer, Russel Information Sciences, Inc. of Torrance, Calif.

The heart of the Pacific region network – a Digital Equipment Corp. PDP-11/35 CPU with 128K bytes of core and an 88M-byte disk storage system – acts like a message-switching center. It works with five DEC PDP-11/04 minicomputers used as data entry stations in San Francisco, Los Angeles and thre other California sites and one each in the other states, Dave Wilborn, Russell's system project manager, said.

Communications are handled through standard Bell System dial-up telephone lines at 2,400- and 4,800 bit/sec and Bell 201C and 300 Series modems, he added.

Asked why Dataflow went with Bell for the communications medium, Hewey explained that, while there were many other carriers, they didn't cover the areas where Bell has service.

"Many of our needs are in the lesser cities and the the boondocks, so Bell is the only realistic carrier so far," he said.

All of the communication hardware is contained in the DEC PDP-11/35, Wilborn noted. "It has all the communications; the system has no separate front-end processors or multiplexers."

(Continued on Page 50)

September Seen Earliest Time Users Can Eliminate Bell DAAs

By Ronald A. Frank
Of the CW Staff

RICHMOND, Va. – Despite legal objections to a court order which blocked the Federal Communications Commission's (FCC) plan for the certification/registration of customer-provided equipment for use on the telephone network [CW, May 10], it now appears doubtful that users will be able to eliminate their Bell-supplied Data Access Arrangements (DAA) before September.

Following the recent last-minute stay issued by an appeals court judge here, motions for reconsideration were filed by many interested parties, including the Justice Department and the FCC.

The FCC motion told the court that "with respect to possible rate increases to general subscribers . . . there is little if any possibility [that rates will be increased] . . . as a consequence of commission orders."

The FCC's motion for reconsideration further said that if the stay postponing the more liberal interconnection policy is not lifted, the affected customers "will incur substantial expenses to obtain and lease the 'protective interfaces' required under present telephone company tariffs.

"Thousands of new interface devices, which have been determined to be unnecessary, will be installed and must be paid for by innocent consumers every month the stay is in effect," the FCC said.

In asking for reconsideration, the FCC said it wanted the full panel of the Fourth Circuit Court of Appeals to review the stay order, which had been issued by only one member, Judge H.E. Widener Jr.

Unless the court decides to overturn Widener's stay order, the next date in the legal proceedings is Sept. 21. Even if the stay is lifted, the court will have to address AT&T claims that the certification/registration program authorized by the FCC should not take effect for various legal reasons.

It appears unlikely the certification/registration program will go into effect before September, according to one legal source. If the court does decide to vacate the stay order, the program could go into effect only on a temporary basis until other legal claims of AT&T are considered by the court, he said.

Auerbach to Support Data Users

NEW YORK – Auerbach Publishers, Inc. will introduce at the National Computer Conference here this week a five-level advisory service designed to assist users in data communications planning.

Called Datacomm 80, the service includes five publications available on a yearly subscription basis. Datacomm 80 is modular and users can subscribe to the level geared to their expertise in data communications and their needs in terms of products and carrier services, Auerbach said.

The entry-level offering of Datacomm 80 is a monthly report called "Datacomm Advisor."

Described as an introduction to data communications, it defines basic terms and concepts.

The next level is called "Data Communications Management" and is a one-volume "information service" which includes data on a planning, budgeting, designing and administering a communications system.

Next in complexity is the "Data Communications Notebook," a two-volume service with specifications and prices on 1,200 available terminals and other equipment. The fourth level is the five-volume "Data Communications Reports" with details on terminals, minicomputers, data entry systems, etc.

The final level, called "Distributed Systems" is an 11-volume "end-to-end service" for designing and implementing a distributed processing system, Auerbach said.

The "advisor" is priced at $89.95, the management service costs $125, the "Data Communications Notebook" costs $350, the "Data Communications Reports" are priced at $950 and the "Distributed Systems" volumes are available for $2,150.

All prices cover one year of service with updates. Auerbach is at 6560 North Park Drive, Pennsauken, N.J. 08109.

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Spectron Has Testers For Troubleshooting Network Problems

MOUNT LAUREL, N.J. – Spectron Corp. has introduced two devices designed for troubleshooting data communications network problems.

The Model T-611 high-speed tape unit can record all traffic on both sides of a data link; the programmable Model D-501 Datascope allows data of interest to be captured and displayed on a small CRT screen, Spectron said.

The T-611 tape unit features full-duplex data stream tape recording; acceptance of all codes and line disciplines up to 56 kbit/sec; and compatibility with EIA RS-232C, CCITT V.24 and V.35 and Bell wide-band type 303 interfaces, the company said.

Below communication speeds of 44 bit/sec, the T-611 produces tapes which can be replayed on any Model 601 Datascope. Tapes recorded at any speed can be replayed on the unit with a cable connection to any model Datascope CRT for display, Spectron said.

The unit is said to be compatible with most forms of data transmission, whether synchronous or asynchronous; it also can be left on-line indefinitely – an endless loop format is used even though the tape is not physically arranged as a loop.

Tape speed of the Model T-611 is either 25- or 100 in./sec among four tracks on a 3M Co. DC300A tape cartridge; the two different tape velocities and block lengths are used for recording to accommodate the wide range of transmission speeds, Spectron said.

At speeds above 19.2 kbit/sec, remote connector unit (RCU) can be specified which require signal conversion and connector adaptation, the firm noted.

The price of a basic T-611 is $5,500; additional RCU interfaces are priced between $135 and $650.

The Model D-501 tester is a programmable and portable member of the Datascope family of communications channel diagnostic equipment, Spectron said.

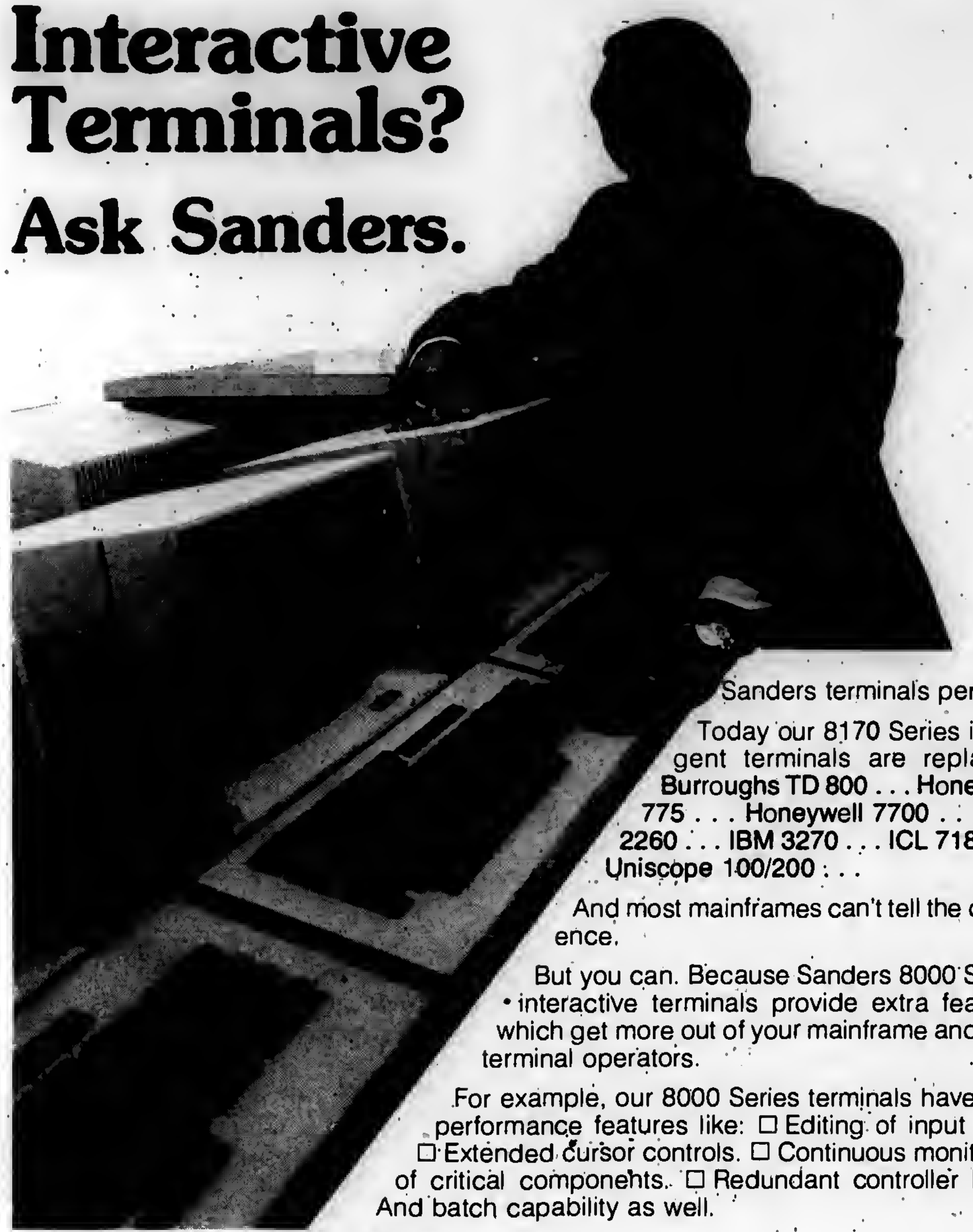
A programming language is said to permit recognition of information patterns in a full-duplex data stream; a 2K-character buffer allows data to be captured and scrolled backward or forward on the 5-in. 375-character CRT screen, the company said.

Up to 9,999 events can be counted by a programmed event counter, it added.

The D-501 features compatibility with any speed, any code, synchronous or asynchronous framing, IBM Synchronous Data Link Control, High-Level Data Link Control and 5- to 8-bit characters.

Other features include a full-duplex, time-correlated display with receive leg underlined, up to four alphabets, parity check and simultaneous carrier and request-to-send markers.

The 25-lb D-501 is priced at $9,500, Spectron said from Church Road and Roland Ave., Mount Laurel, N.J. 08057.



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The basic objective of T. T. I.'s first in-depth seminar is to acquaint the participant with modern techniques of computer network design, both from the analytical as well as from the practical point of view. Topics include packet switching, resource sharing, teleprocessing systems, and network evaluation and design. Experience with an existing international network (the ARPANET) and its operational procedures and pitfalls with their solutions will be presented. Measured performance and the cost-effectiveness of large scale computer networks will be discussed. The new advanced technology of satellite and ground radio packet switching will also be a feature of the seminar. The material presented represents the latest knowledge and experience with modern computer networks and provides fundamental understanding concerning their design, use and impact in the future.

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NCR Micro-Based Bank System Modular

WASHINGTON, D.C. – NCR has a modular financial terminal system which includes separate keyboards, visual display units, printers and magnetic stripe readers that can be used in any combination.

The NCR 2500 microcomputer-based terminal system can be used to tailor workstations to handle specific types of teller transactions at individual commercial banks and thrift institutions, NCR said.

The NCR 2500 includes:

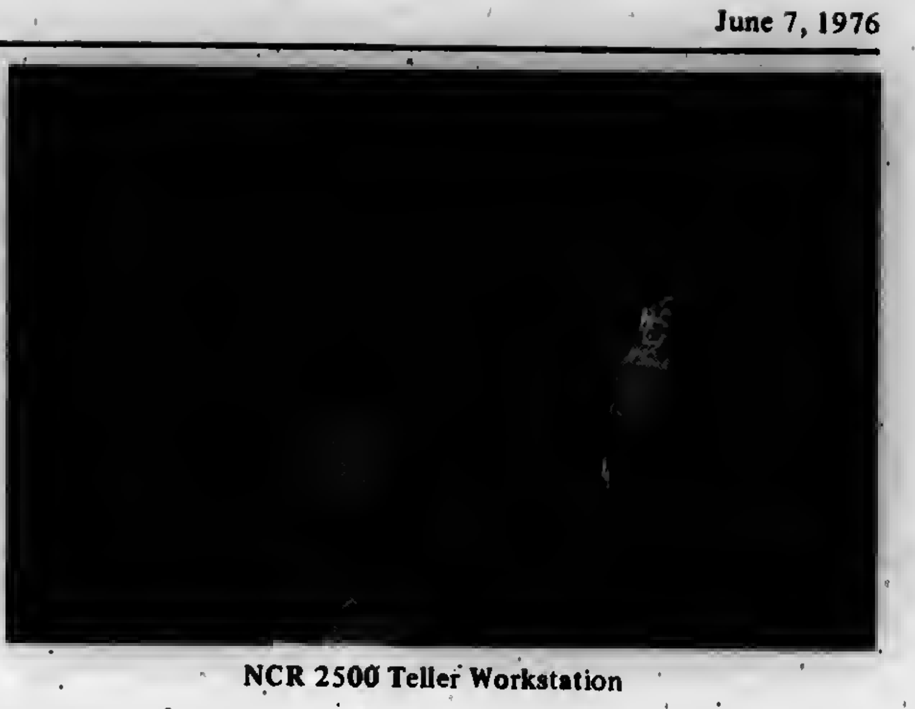
- A microcomputer system which directs and controls the various elements of the system.
- Interactive controllers which handle communications functions between the microcomputer system and the various elements.
- Three types of keyboards – 16- and 44-key versions for function and numeric data entry and a 56-key alphanumeric version that can be used for inquiry by name, change of address and other functions requiring both numeric and word input.
- Two visual display units that show numeric and alphanumeric characters as well as special messages for the teller.
- Three printing devices: a basic single-station printer, a three-station printer and a passbook printer.
- Two types of magnetic stripe devices, one which reads magnetic stripe data from plastic cards and a second which can read and write data on the magnetic stripe of a savings passbook or a plastic card.
- An automatic change dispenser.

Up to eight workstations with a mixture of keyboards, displays, printers and magnetic stripe devices can be used with a single microcomputer system, NCR said.

Terminal Transactions

Prices for the basic 48K microcomputer begin at $10,020; monthly rental is $375. Other elements of the system are priced separately, as are the thrift and commercial bank application software packages.

Prices for a typical eight-station system including a numeric function keyboard and display and journal validation printer at each station, plus shared passbook/document printers and alphanumeric keyboards, begin at $7,750 per station, including software. Equivalent rental prices begin at $290/mo per teller station.



NCR 2500 Teller Workstation

Net Optimizes Record Retrieval

(Continued from Page 47)

DEC operating system software, modified by Russell, is used to handle optimized message-switching formats.

Dataflow is using Sycor Model 340 intelligent trminals and Lear Siegler ADM-1 terminals for data entry at local and remote offices, he said.

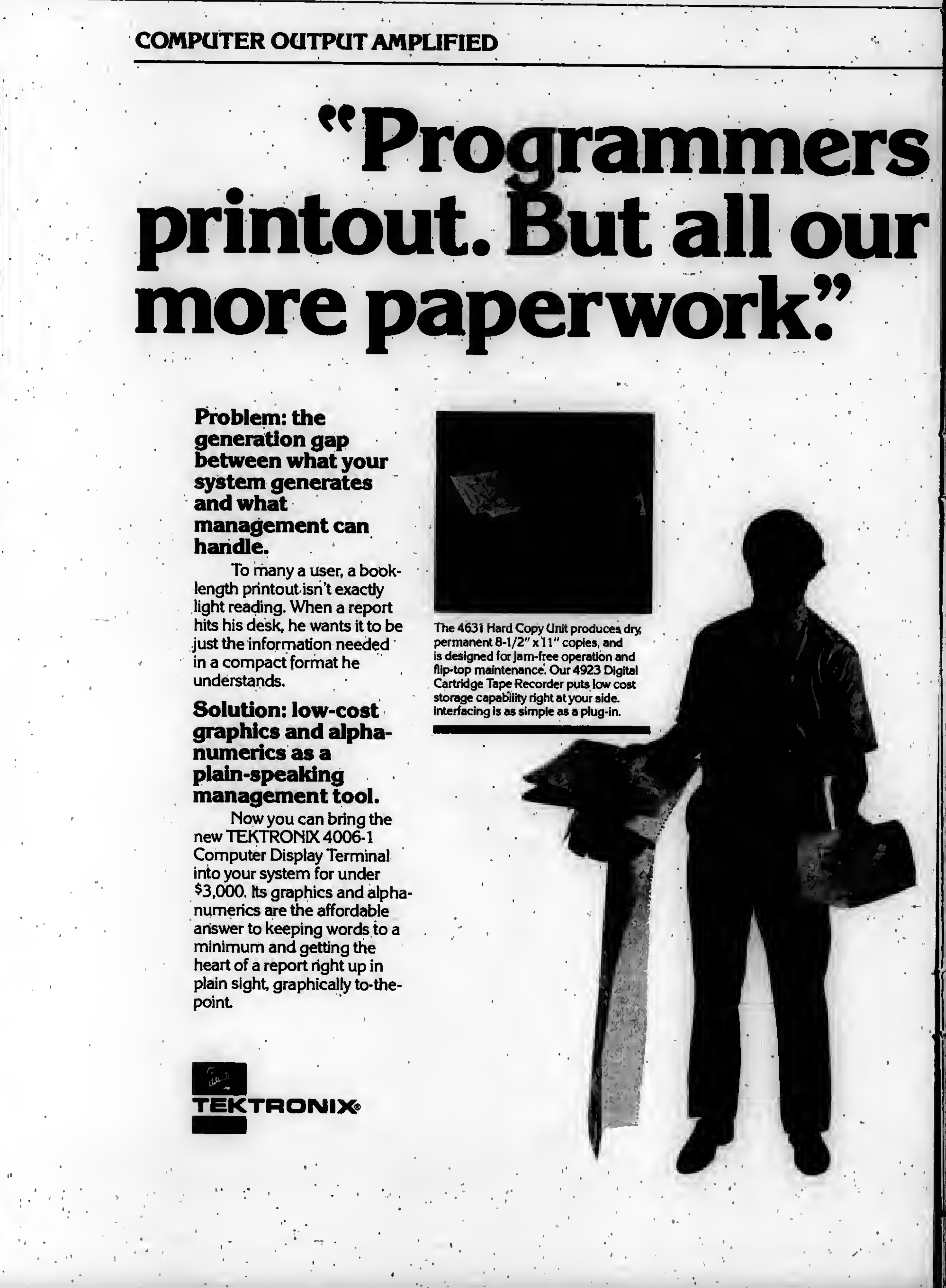
As work volume increases, the data entry stations will be upgraded in some areas to the larger PDP-11/04s, he added.

Accomplishment of the two primary objectives contributes to cost savings. In one respect; the 24-hour turnaround time for processing DMV records allows Dataflow to offer its customers "the same product faster at a lower rate" or, in other words, "the marketability of faster service," Hewey said.

Another cost cutter is the immediate data validation; some states charge for invalid DMV record requests, which is a significant cost item, Wilborn said.

More than 200 terminals will be feeding into the national network from Dataflow's branch offices, larger customers' offices and from six regional centers.

The amount of time when a potentially bad driver is on a policy could involve substantial dollar losses. There are cost-savings reasons and industry competition reasons for a service company like Dataflow to install a communications network, he said.



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Disk System Emulates Terminals

MOUNTAIN VIEW, Calif. – Tri-Data Corp. has an RS-232 coupler interface which it said allows its Flexifile 10 floppy disk system to interface with and emulate terminals and modems.

As a modem replacement, the floppy disk system can receive up to 96K bytes on a single disk from a terminal and allows off-line editing, batching and storage until the information is transmitted, the company said.

Once these functions are performed, the system reportedly can be used in place of a terminal to transmit to a modem; continuous transmission of data may take place without operator interruption, the company said.

The interface can handle transmission speeds up to 9,600 bit/sec and is priced at $125. With the Flexifile 10, it costs $1,410, Tri-Data said from 800 Maude Ave., Mountain View, Calif. 94043.

Gandalf Develops Synchronous Data Set

WHEELING, Ill. – Gandalf Data, Inc. has developed a synchronous data set for point-to-point or multipoint transmission applications which do not use a centrally clocked digital network.

The LDS 309 does not require dc continuity and complies at all speeds, the company said. At 9,600 bit/sec over 26-guage wire, the LDS 309 can transmit a distance of eight miles.

Standard features include self-testing with an artificial line, circuitry which enables equalization and installation without the use of an oscilloscope.

There are two versions of the data set; a six-speed version ranges in price from $1,800 to $9,600 and a single-speed version costs $786. With an option adding speeds of 14.4- to 19.2 kbit/sec, the single-speed version costs $900.

Delivery takes two weeks from the firm at 190 Shepard Ave., Wheeling, Ill. 60090.

Prentice Asynchronous Line Driver Increases Data Transmission Rates

PALO ALTO, Calif. – Prentice Electronics Corp. has introduced an asynchronous line driver (ALD) which reportedly increases asynchronous data transmission rates and allows users to utilize terinals, CPU ports and data transmission lines to their fullest extent.

The ALD operates over common loaded multiguage cable at transmission rates in excess of 4,800 bit/sec. Over nonloaded cable, the ALD is capable of speeds greater than 9,600 bit/sec, the firm said.

The ALD's transmission distance ranges up to 20 miles. Capable of operating over either two- or four-wire lines, the unit can perform in either half- or full-duplex modes as well as in a polled environment.

The ALD is modular for maximum compatibility with existing dial-up or leased line hardware. It mounts into existing Prentice enclosures, and up to 88 fit into a P-1000 cabinet, Prentice said.

The ALD conforms to Bell specifications and no test equipment or adjustments are required for installation, according to the vendor.

Prices start at $280, Prentice said from 795 San Antonio Road, Palo Alto, Calif. 94303.

CRT From Omron Features Control

SUNNYVALE, Calif. – A CRT terminal with an expanded data transmission capability in "protected field" mode has been introduced by Omron Corp. of America's Information Products Division.

The Omron 8025C communications display terminal is a firmware-programmed, micrprocessor-controlled CRT designed for stand-alone or on-line data entry, the vendor said.

It will operate in both normal mode and the protected field mode; in the latter, protected areas of a form cannot be altered when variable data is inserted in unprotected "blanks."

Omron has extended the protected field capability of the 8025C by means of "literals transmission," a feature which is said to permit identification of the beginning and end of data fields by transmission of control characters embedded in the protected field.

Literals transmission provides increased flexibility and control of data flow and improves data reliability, Omron said.

Refresh memory is available for storage of up to 48 lines (two pages) of data, a total of 3,840 characters. In addition, the terminal will support RS-232-compatible peripheral devices.

The unit is teletypewriter-compatible with transmission rates to 2,400 bit/sec asynchronous in full- or half-duplex mode.

The terminal costs "under $3,000" in OEM quantities, Omron said from 432 Toyama Drive, Sunnyvale, Calif. 94086.

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Hydra Has 800 Line/Min Matrix Printer

MOUNTAIN VIEW, Calif. – Hydra Corp. has introduced a communication matrix printer with a "memory management" capability that provides for a short line throughput in excess of 800 line/min. The Model 18 COM printer interfaces to RS-232C, CCITT or current-loop communications lines with speeds from 75- to 9,600 bit/sec.

Asynchronous reception of Ascii, Ebcdic or Baudot is available with memory sizes from 512- to 1K characters.

The Hydra printer is capable of continuously printing short lines at 1,200 bit/sec without requiring transmission of pad or fill characters to allow the printer to accomplish the basic functions of carriage return and line feed, a company spokesman said.

A single block of 1,400 characters of 10-column-width lines can be transmitted to the printer at 1,200 bit/sec, Hydra said.

The communication printer includes a bidirectional high torque lead screw servo drive to allow rapid reversal of the printer carriage; a look-ahead subroutine for the microprocessor to determine what the next mechanical movement of the printer should be, along with a paper advance drive motor to allow for short line performance of over 800 line/min, the company said.

The printer can be custom programmed to provide polling, addressing station select, block checking, code conversion, unattended automatic answering and other features without the addition of hardware, it noted.

The Model B COM printer sells for $3,900 in single quantities, the spokesman said. The price includes the 180 char./sec bidirectional printer with RS-232 or current loop interface, a 512-char. buffer and the microprocessor controller, the spokesman said from 2218 Old Middlefield Way, Mountain View, Calif. 94043.

Turnkey Features Intelligent CRT, Teleprinter Units

DALLAS – Interactive Systems Technology (IST) has a minicomputer-based turnkey hardware and software system featuring intelligent CRT displays and teleprinters.

The Advanced Interactive Data Entry (Aide) system can reportedly be utilized as a remote terminal system, a remote processing system or a stand-alone business system, IST said.

Aide is said to offer interactive software techniques, including character and field-level editing, referencing of field-processing routines and core-resident reentrant data entry formats.

Remote Aide terminal systems eliminate host transmission of data entry formats, minimize overhead of host computer communications functions and improve line utilization, the company claimed.

Aide also supports simultaneous background remote job entry (RJE) and on-line interactive processing, IST said.

A typical turnkey system consists of a minicomputer with 32K bytes of memory, synchronous and asynchronous communications adapters, a 315K-byte diskette subsystem, four 1,920-character CRT displays with keyboards and a 100 char./sec printer and is priced under $25,000, including Aide software, the company said. IST is located at 4450 Sigma, Suite 135, Dallas, Texas.

Sidereal Unveils ASR Terminal

PORTLAND, Ore. – A four-row keyboard, automatic send/receive (ASR) terminal, the Micro Net, is available from Sidereal Corp.

The terminal is controlled by a microcomputer and can simultaneously access TWX, Telex, Timeshare, DDD satellite, private lines and computers, the company said.

Micro Net can access and communicate directly with other terminals, bypassing code conversion, the firm said. Message preparation is standardized on a Micro Net-created tape, and the terminal produces a printed copy of the taped message, Sidereal said.

Other features include an automatic time/date stamp on all messages sent and received, automatic keyboard dialing and redialing and a mini-buffer mode which allows the user to create a short message in the buffer memory and send it automatically without using tape, the company said.

There is also a built-in, self-diagnostic capability, which allows the operator to isolate difficulties ih the terminal, the microprocessor module or on the line, Sidereal added.

Maintenance is available from any Western Union office. There are two models available, the Micro Net 33 and 35. The 33 is priced at $2,970 in quantities of 12, and the price of the 35 varies with the configuration.

Sidereal is at P.O. Box 1042, Portland, Ore. 92707.

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Unlike COBOL or BASIC, DASL programs make efficient use of the computer, supporting a high volume of activity with excellent terminal response time. As your applications grow in volume, or as you add new ones—add video terminals and file storage as needed without changing your programs. DASL supports up to 16 terminals in concurrent use, and an unlimited number of independent applications.

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Net Copes With Newspaper Ad Increase

By John P. Hebert

Of the CW Staff

RICHMOND, Va. – Two daily newspapers here have computerized their combined classified advertising departments by installing intelligent terminals in an on-line network.

The on-line network has allowed both newspapers, one a morning paper, the other an afternoon edition, to do 20% more work – in the form of 1,000 new classified ads and over 500 maintenance items each day – with existing personnel.

Media General, the communications corporation and holding company for the *Times Dispatch* and *News Leader*, dismissed the more traditional approaches to classified advertising by installing Sycor 250 intelligent displays.

The IBM-compatible terminals allow each operator to key in classified ad information received by telephone and to verify the information on the terminal's CRT screen.

Operating functions for the 30 CRT terminals include checking to insure all fields are keyed, that numeric data is in the appropriate fields and that range checks are performed on valid numbers.

Data is then transmitted through the communications network – over coaxial cables to a Sycor line controller, intermediary modems and through a Memorex 1270 communications controller – to Media General's IBM 360/50 mainframe one block away, a Media General spokesman said.

The computer system reedits the ad data for valid contract numbers and cost-rates each advertisement. This processed data is then returned to the Sycor CRTs where the terminals show how many lines of print are required for each ad and how much it will cost the subscriber.

An advisor can then make whatever alterations are necessary and return the entire screen to the CPU. Once a day the mainframe scans the data base of classifieds and puts them into categories, alphabetic sequence and pagc number and checks credit ratings.

The data is then output to a 9-track tape drive and hung onto a Harris Fototronic CRT which typesets the information for final printing. Once a month the entire data base is microfiched for audit and historical purposes.

The system has proven particularly useful in "kill," "pickup" and correction situations. Before the system was installed, if someone wanted to kill his ad before the contract time, it would take a person in both billing and classifieds to find the correct advertisement and to stop it as soon as possible.

What often happened, however, was that the classified ran longer than intended or was billed incorrectly. With the data base system resident in the CPU, the operator keys the information in and deletes the file which, in turn, stops the billing cycle. Too many hands were also involved in the pickup or extension of a contract period classified, the user said.

Corrections, likewise, that used to be a cumbersome manual effort, are now searched by contract number, last name or category, and insertions or deletions to the data are keyed in via the terminal's typewriter-like keyboard.

Besides increasing the accuracy of the data and reducing the redundant storage of information, the system has also reduced clerical intervention. Now the advisor who takes the advertisement is responsible for typing it, rating it, billing it and categorizing it – nobody else touches it until it gets into the paper.

The system also allows the generation of reports previously deemed economically unfeasible under manual systems. It produces sales and performance analyses as well as resolicitation reports so that advisors will know when which advertisement has lapsed and allow them to call the individual to resolicit the business.

Teleprinter Bows

HOUSTON – Tel-Tex, Inc. has a product entry for the telecommunications industry: a microprocessor-based teleprinter capable of interfacing three separate communications networks.

The Model 300 teletypewriter is capable of 30 char./sec operation. It operates on the Telex network at 6.6 char./sec, the TWX network at 10 char./sec and on Bell's Direct Distance Dial (DDD) network at 30 char./sec speed, Tel-Tex said.

The Model 300 features 4K characters of memory with incremental expansion up to 16K characters.

Prices for the modular teleprinter start at $3,295; five configurations are presently available: Telex, TWX, TWX/DDD, Telex/TWX and Telex/TWX/DDD.

Delivery is in 60 days, Tel-Tex said from 3203 Audley, Houston, Texas 77098.

Sycor Adds 10M Bytes Of Storage to 440

ANN ARBOR, Mich. – Sycor, Inc. has added 10M characters of fixed-disk storage to its 440 clustered terminal processing system.

The system's expanded file capacity of 20M characters is said to allow 440 users twice the storage capacity for file sharing and management and local inquiry/response.

The single-platter, fixed disk contains systems programs, user programs and data files in 512-char. sectors. Spare sectors, automatically assigned and accessed, are also provided as backup to any sector which is found to cause a write error. Seek time, track to track, is 10 msec; maximum, 100 msec; averagc, 70 mscc. Disk speed is 2,400 rev/min.

A four-station 440 system consisting of a 10M-char. disk, 64K bytes of memory, cassette interchange mcdia and communications leases for $816/mo on a three-year lease and $963/mo on a one-year lease, including maintenance. The purchase price of the four-station system is $29,270.

The additional 10M characters of storage adds $194/mo to the three-year lease and $230/mo to the one-year lease, including maintenance. The purchase price of the additional storage is $9,000. Deliveries are expected to begin in December.

Sycor also announced the addition of Cobol to its 440 clustered terminal processing system and two diskettes to its Model 350 intelligent terminal.

The firm is at 100 Phoenix Drive, Ann Arbor, Mich. 48104.

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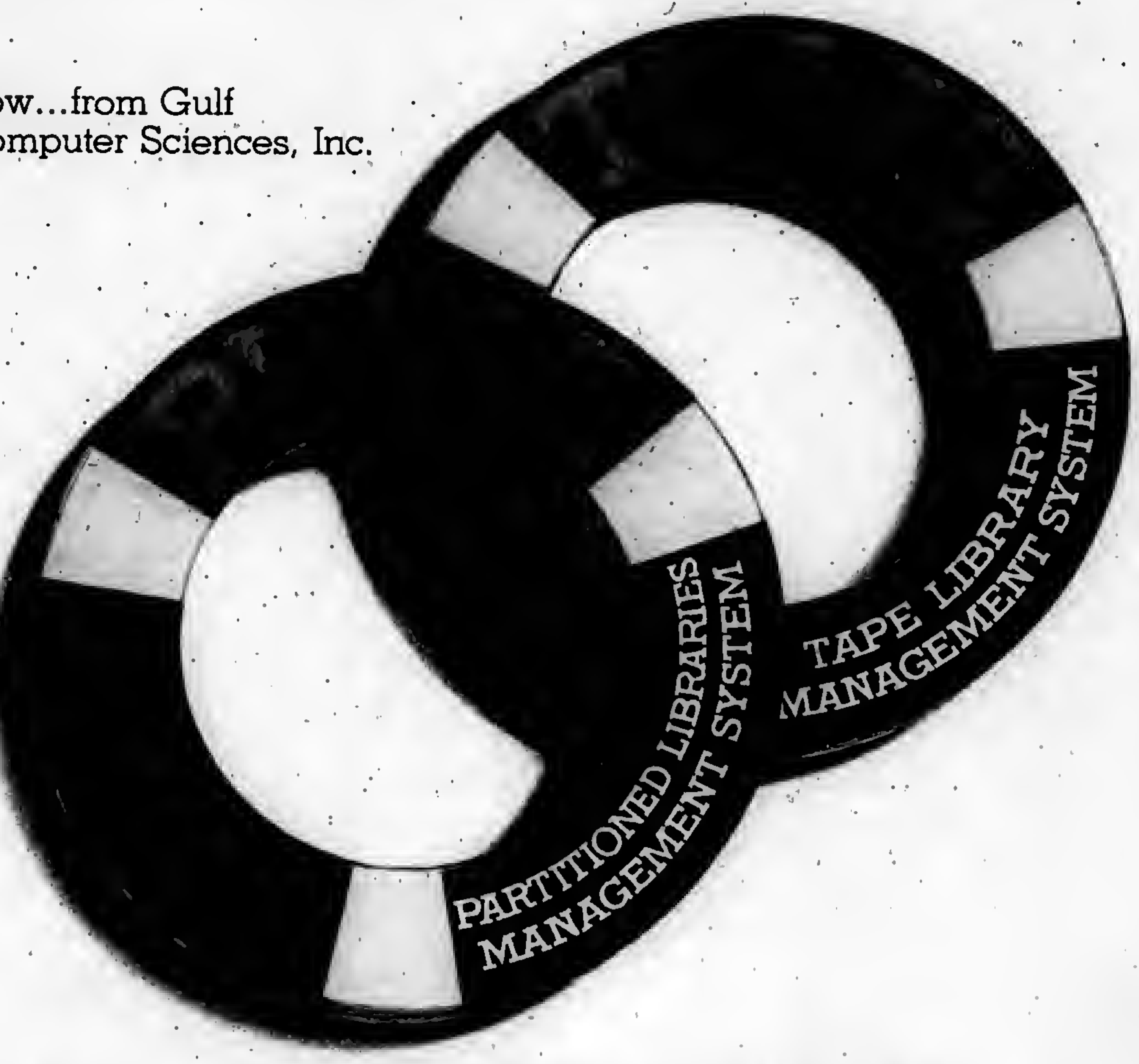
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TLMS is a data capture and reporting system, both online and offline. Online, it can update the master file, provide protection of data sets, provide inquiry and update, and optionally, it can generate external labels for tape output. Offline, it provides reports of library activity, which help to manage the library.

It has proved its ability to provide data security, inventory management, and cost reduction.

Enter PLMS. Now, Gulf Computer Sciences is out with something new . . . PLMS — a series of programs which provide for security control of all partitioned data sets. PLMS provides controlled updating, operational backup and audit reporting of all partitioned data sets — including load module and procedure libraries.

Both packages are compatible with OS/360/370/MFT/MVT/VS1/VS2/multiple CPU's. You owe it to yourself to look into them further.

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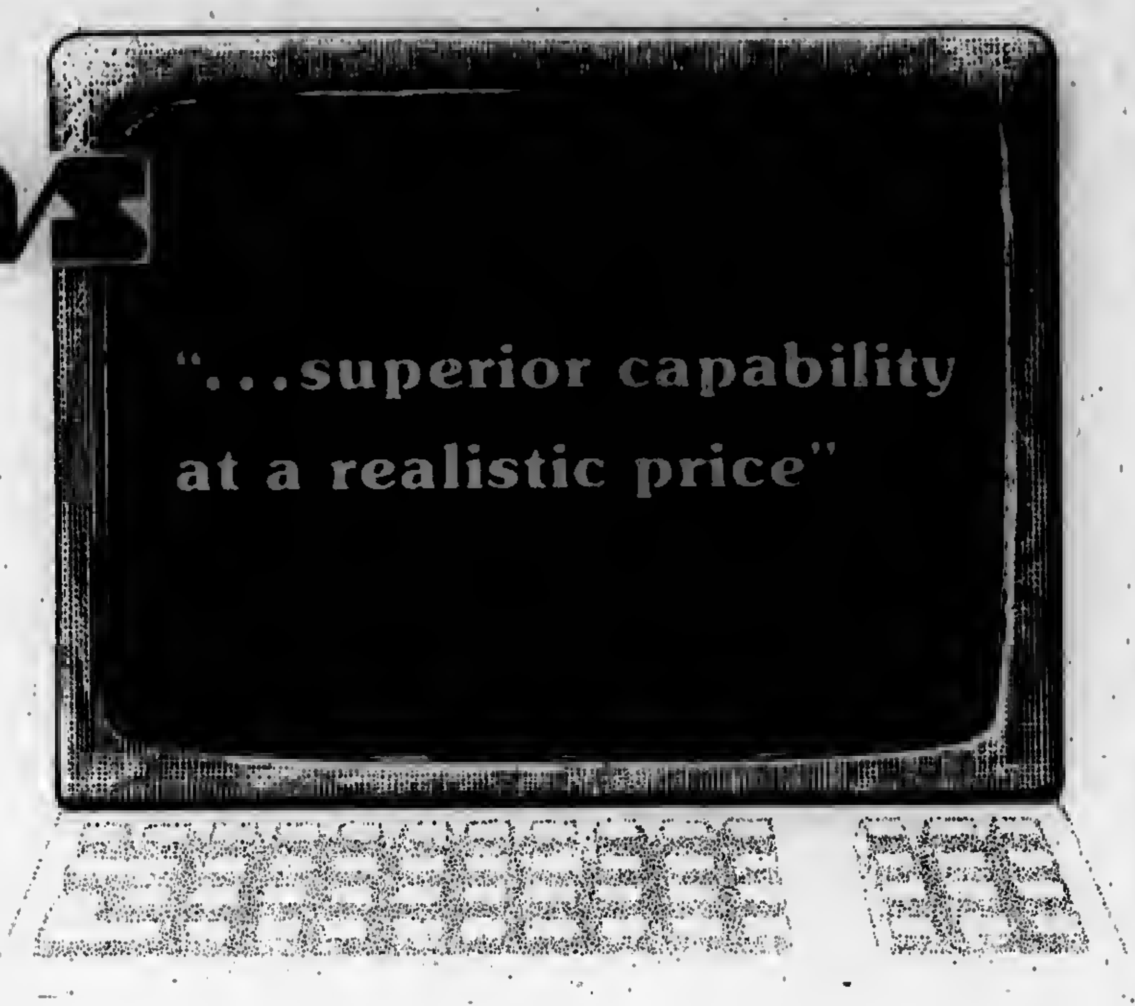

An English-like Inquiry Language for IMS or IMS/VS

IN?UIRY/ims allows users of IBM's Information Management System (IMS) to easily and efficiently access their data bases. IN?UIRY/ims utilizes an English-like language and operates as a message, message batch, or batch program. The user does not have to know the physical characteristics or the detailed organization of the information stored in the data base.

IN?UIRY/ims is designed for all users regardless of their technical orientation.

ELIMINATES APPLICATION PROGRAMMING. Although IMS's Data Language/One (DL/I) provides the programmer independence from access method, device characteristics and data storage organization, user written programs are still required to retrieve information from a data base. IN?UIRY/ims interprets English-like inquiries and converts them to the code required by DL/I to retrieve user requested information.

ARITHMETIC CALCULATIONS. IN?UIRY/ims provides the capability to perform arithmetic operation on data fields and/or constants and to return the result for action by the verb in the inquiry.

PRE-STORED INQUIRIES AND ARITHMETIC FUNCTIONS. Frequently used or lengthy Inquiries and Functions may be stored in executable form and "called out" via a simple code eliminating the need to physically input the same inquiry or function over and over.

ALL TERMINAL TYPES SUPPORTED. In addition to the IBM 3270 type terminal, all IMS supported terminal types or their equivalent, IBM 2740, IBM 2741, TWX are supported by IN?UIRY/ims.

MULTI-PATH LOGICAL OR PHYSICAL DATA BASES. IN?UIRY/ims can retrieve and logically relate multiple fields from multiple paths in either physical or logical data bases.

ON-LINE AND BATCH SUPPORT. IN?UIRY/ims will operate as a message processing program, as a batch message processing program or as a stand-alone DL/I batch program. IN?UIRY/ims in no way modifies IMS, nor is it any more dependent upon a specific version of IMS than any other IMS user application program.

TSO INTERFACE. IN?UIRY/ims provides an interface against DL/I data bases in the inter-active TSO environment eliminating the requirement for IMS data communications. This interface can be used for both data base diagnostics during program development as well as a production inquiry capability.

OPTIONAL INPUT/OUTPUT. For an on-line inquiry any keyboard terminal can be used. However, IN?UIRY/ims also supports batch mode operation in which inquiries can be made via a terminal or punched cards, and replies are made either to the terminal or a line printer.

TAILORED TO THE USER INSTALLATION. The standard IN?UIRY/ims vocabulary and diagnostic message text may be modified by the individual installation. The vocabulary which contains all words used in the language can be added to or changed for each application area if necessary, and a vocabulary may be created in a language other than English. The diagnostic message text may be expanded or shortened depending upon the installation standards.

DATA FIELD SECURITY AT TERMINAL LEVEL. Access to a data base and the fields within the data base is possible only through the IN?UIRY/ims user dictionary. Since a user dictionary may exist for each terminal user, the absence of the data field definition prevents retrieval of that data element and provides unauthorized access security at the field level.

PERFORMANCE INTEGRITY. In order to minimize IMS overhead IN?UIRY/ims has implemented inquiry page and time limit specifications by IMS logical terminals. This capability allows a user to stop an inquiry after a page and/or time limit and free IMS resources.

FOR MORE INFORMATION ON IN?UIRY/ims MAIL

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Advances Continuing Fast Pace

Memory Prices Seen Dropping 40%/Year Until '80

By John P. Hebert
Of the CW Staff

BOSTON – Advances in memory and storage technology are continuing at a fast pace, with price reductions seen by an IBM research scientist at a rate of up to 40% per year until 1980.

Speaking here recently, George C. Feth of IBM's Thomas J. Watson Research Center classified the status of the important memory and storage technologies and projected cost/performance trends of MOS random-access memory (RAM), charge-coupled devices (CCD), magnetic bubble devices, electron beam-accessed MOS (Ebam) storage and moving-head disk file technologies for the next four years.

Feth said 4K-bit MOS RAM chip prices have fallen to less than .2 cent/bit with lower performance versions available for about .11 cent/bit, while 16K-bit CCD chips are available and prices are projected to be a fraction of MOS RAM price per bit, with a 64K-bit chip in development.

Additionally, 1K bipolar RAM chip prices have decreased to about 1.5 cent/bit, he said, adding that a CCD store with 128K-byte capacity of the basic 8-bit or 9-bit byte module has been introduced, with a selling price of about .25 cent/bit for the module or about .3 cent/bit including controls and buffering.

Moving-head disk files now sell for a little over 1 mcent/bit in large-capacity systems, he noted.

Feth gave a rundown on the present state of memories in large computing systems today and noted "MOS RAM, especially using the 4K-bit chips, is being chosen over core for the majority of applications; it offers overall advantages in price, performance, flexibility and powering and can be designed to be upgraded straight-forwardly when 16K-bit chips become available.

"While price and access time are not the only important characteristics of a store . . . they do provide a convenient and meaningful way to characterize the various technologies," he explained.

"Fixed-head files constitute a major deviation from these characteristic price/performance lines," he said.

"Options which include fixed-head disks within the moving-head disk files have been offered this makes possible a larger access rate.

"It is particularly practical where the indices for the stored data are also recorded in the disk file, in this case under the fixed heads' tracks and access to one or more index records for each random address can be obtained without incurring the track-seeking delay time of the moving-head file."

Serial Storage

"Several storage technologies wherein the stored data is accessed sequentially rather than randomly, but which do not involve mechanical motion, are receiving a great deal of attention and have advanced recently to the prototype or initial product introduction stages," Feth said.

Included in this category are CCDs, magnetic bubble and domain tip (DOT) and Ebam memory technologies, he said.

"The projected characteristics which make these technologies of high practical interest are their fast access compared with the mechanical storage and their relatively modes price compared with RAM.

"The improvements in these characteristics, as well as other potentially attractive features . . . open quite a range of potential application areas.

"Three major approaches to bubble stores are being investigated: the permalloy-bar file (PBF), the contiguous-disk file (CDF) and the bubble-lattice file (BLF).

"The major potential advantages of bubbles are their anticipated extremely high density, relatively few processing steps and nonvolatility. The PBF approach has received the most attention," Feth added.

The CDF approach could lead to larger densities, he noted, however.

"While the BLF approach promises high density and some advantages in insensitivity to unwanted nucleation of bubbles, it requires many (about seven) mask steps. Both the CDF and BLF are too new to fully assess their potential at this time," Feth noted.

On the other hand, "CCD storage has many attractive features and is quite flex-

(Continued on Page 58)

Storage Added to Two 370s

WHITE PLAINS, N.Y. – Following hard on the heels of IBM's memory price reductions for larger systems [CW, May 24], the firm has announced increased memory sizes for the 370/115-2 and 370/125-2 systems.

With the increases, the 115 can now have 50% more memory than before, while the increase for the 125 will allow users to double their present memory on the systems, IBM indicated.

The 370/115-2 is now available with a maximum main memory of 384K characters, up 50% over the previous maximum mandated by IBM. The 370/125-2 is now available in two additional memory sizes of 384K and 512K characters – the latter double the former 256K maximum for the unit.

Monthly rental for the 115-2 with 384K is $6,660 while previously the rental price was $5,600 for a unit with 256K of memory. Purchase price is $220,250 compared with the earlier $192,650.

Previously the top of the 125-2 line sold for $254,050 and rented for $7,155/mo. The units have a rental of $8,215/mo for 384K and $9,115 for the 512K unit. Purchase prices are $281,650 and $303,250 respectively.

Currently installed models can be upgraded to the new versions at the user site. First shipments of the 370/115-2 will be in the first quarter of 1977, while shipments for the 125-2 will begin in this year's fourth quarter.

Two More Printer Alternatives Available to Users

• Diablo Releases 200 Char./Sec Device

HAYWARD, Calif. – Diablo Systems, Inc. has announced a 200 char./sec matrix printer that utilizes servo technology to permit high-speed vertical and horizontal tabbing and bidirectional printing.

The Model 2300 matrix printer head can be accelerated to printing speed and stopped – within one print position – Diablo said.

With a 9 by 7 dot matrix that permits descenders to go below the print line, the user can print both upper- and lower-case characters, the company said. Cartridge-type ribbons are used.

The head's ballistic design permits the wire strikers to be in free flight, thereby eliminating field head adjustments, the company said. Adjustments for paper thickness that ranges from one- to six-part can be made by an operator.

The unit also features a low-heat-dissipation head to minimize overheating, the company said.

The printer is microprocessor-controlled, increasing the printer's logic flexibility and permitting implementation of more operating features.

The 2300 is compatible with the Diablo Hytype serial printer, and both use the same die-cast aluminum frame and have some spare parts compatibility, giving OEM customers single-vendor advantage for both daisy wheel and matrix printer requirements, the company said.

The 2300 is priced at approximately $2,400 for one and about $2,000 in OEM quantities of 100 from the firm at 24500 Industrial Blvd., Hayward, Calif. 94545.

• Univac Unit Unveiled For 90/30s, 1100s

BLUE BELL, Pa. – The Univac 0776 impact printer subsystem has been introduced for 90/30 system users under OS/3 and 1100 systems users supported by OS.

The 0776 system attaches to the 90/30 via the multiplexer channel and to the 1100 system via MSA or C/SP, Univac said.

The Univac 0776 printer offers a choice of two line speeds in the mid-price range. The lower speed model operates at 760 line/min while the faster unit operates at 940 line/min. Both models have a 48-character set, although operator-changeable cartridges are available ranging from 24 to 384 characters, the company said.

Noise levels are said to have been reduced to comply with standards set by the Department of Labor's Occupational Safety and Health Administration.

Checking facilities, including as basic functions, include parity check, invalid command check, buffer load check, vertical format code buffer check, form check, type speed check and print actuator check, the company said.

Handles Multipart Forms

Model 0776-00, the 760 line/min model, rents for $1,050/mo including maintenance. The purchase price is $40,800.

Model 0776-02, the 940 line/min model, rents for $1,200/mo including maintenance. Purchase price is $46,080.

The printers will be available after Oct. 1 from Univac at P.O. Box 500, Blue Bell, Pa. 19422.

The printer that printer experts select.

You too can discover peace of mind performance with the Tally Series 2000. Here's a low cost of ownership 200 (or 125) line per minute printer that you can drive as hard as you want without fear of failure. And in the bargain, get outstanding print quality and line registration that never wavers.

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Qantel has installed over 450 systems. We have more than 350 customers and currently ship over 20 business systems a month, giving us 200% growth over 1975.

Even through times of tight money and uncertainty, profits at Qantel increased each month since July, 1975. In that same period of time the backlog of orders has doubled.

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Not only is our financial picture looking brighter, so is our product development.

The new System 1300 is truly a remarkable achievement. It's up to four times faster than other Qantel models, and it expands user capacity up to 40 separate operators.

But the most useful aspect of this news is that the 1300 is a substantially faster processor that is completely compatible with existing Qantel hardware and software.

We believe in modularity.

An operation can grow with the Qantel system – indefinitely. The initial investment in systems design, programming and operator training is never obsolete.

This opens up the world of multi-users doing multi-applications. With a properly configured Qantel system you can remove the bottlenecks that can plague any accounting system.

The facts will speak for themselves.

Qantel presently markets five systems: Models 800, 900, 950, 1200 and the new 1300.

The starting price is $22,500. Even the smallest standard configurations contains 32K bytes of main memory, six million bytes of fixed and removable disc storage, and a 45 characters-per-second typewriter terminal.

At the other extreme, main memory is expandable to 128K bytes, and disc storage is expandable to 640 million bytes. And the 1300 can support up to 40 video terminal operator stations. Even the most demanding print requirements can be satisfied by up to two 600 lines-per-minute printers.

Qantel systems provide up to 13 I/O channels, up to nine of which are direct memory access channels with data rates up to 900 KB. Data communications, both synchronous and asynchronous at data rates up to 50 Kilobaud, are easily handled by a specially designed, independently functioning mini-computer on a controller. Most non-DMA device controllers are fully buffered, permitting minimum system involvement with I/O, and maximum performance.

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Scientist Predicts Prices of Memory To Drop Until 1980

(Continued from Page 57)

ible. Sensing and other supporting functions are easily accomplished by means of MOS devices on the same chip and utilizing the same technology.

"In the future, the cost of CCDs is expected to be a fraction of that of MOS RAMs for a given level of technology capability. Improvement by a factor of from 2 to 10 times appears quite probable," he said.

"Anticipated advantages of Ebam technology have to do largely with the use of the electron beam: the density possible from the very narrow beam with diameter of the order of a micron, the deflection speed of the beam, the gain inherent in the generation of many carriers per electron in the beam.

"On the other hand, the cost of the tube and electronics is substantial and therefore the designs involve large capacity, in order to obtain attractive price per bit," he said.

The price of a minimum system with "modular size on the order of 10^8 bits is large compared with that for the CCD and bubbles, where module capacity of the order of 10^6 bits seems economical," he said.

First deliveries of the Ebam systems are scheduled for the last half of this year, he said.

"These include a 10^8-bit multitube system at a price of a little over .1 cent/bit to the end user. In the future, tubes of 10^8-bit and 10^9-bit capacity using two-stage deflection and multitube systems with 2 by 10^9 bits are projected at prices well below 10 mcent/bit.

"It is apparent that even today, CCD's and Ebam's price/bit and performance characteristics are quite competitive with the high-performance fixed-head disks," Feth said.

"Only small improvements in price will be needed to make CCDs and bubbles competitive with flexible disks (when the price of the disk's controller is included, as in its upper price extreme); Ebam's would not be competitive with flexible disks because of the large price of the minimum Ebam module.

"Josephson-junction technology, while still very speculative, offers potential for future high-performance logic and memory. Memory devices have been described and studies have been performed for a nondestructive-read memory with about a 2-nsec cycle time and for a destructive-read memory about 1/10 as fast.

The process of evolution will be at work to provide improvements in nearly all technologies, Feth said, and cited the price trends over the past few years for semiconductor RAMs, which have decreased at a rate of about 35% to 40% each year.

"It is not clear whether these trends can continue at the same rate," he noted.

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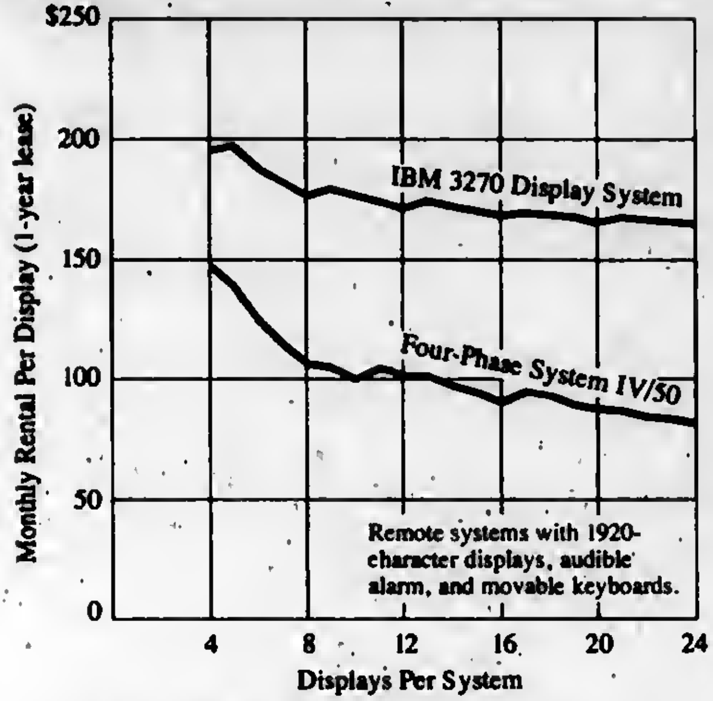

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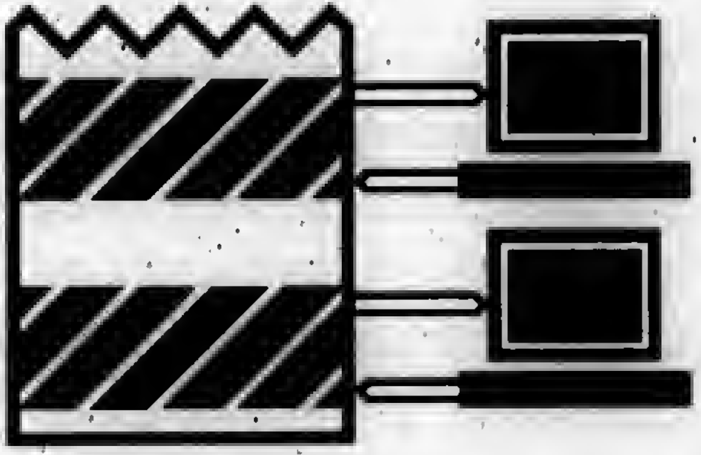

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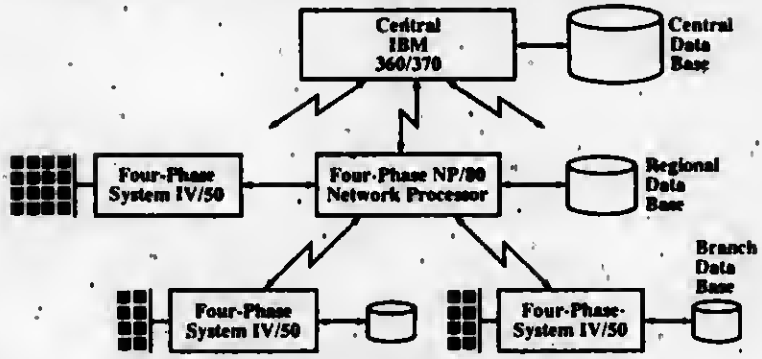

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Off-Site Storage Facility Can Prevent Catastrophes

By Belden Menkus

Special to Computerworld

- *When the Arizona State Finance Center in Phoenix discovered in December 1971 that one of its tape files had disappeared, it tried to reconstruct the file from punch cards. To its dismay, it learned that 2,000 of the cards had just been destroyed – folded, gilded and used as Christmas decorations.*
- *Several days before it was due to receive a fire-prevention award in July 1973, the U.S. Military Personnel Records Center at Overland, Mo., was hit by a fire that knocked out part of a DP center. Along with it went most of the records for World War I veterans.*

To DP managers, incidents like these read like horror stories. They are not isolated examples, however, and they're occurring today with increasing frequency as information storage is centralized.

There is a good cause for horror – reconstructing files can be extraordinarily difficult and time-consuming or, in other words, expensive.

It's been estimated, for example, that its costs $25 to enter a name and related information on a credit-card list. Since a tape may contain as many as 15,000 of these entries, the expense of putting Humpty-Dumpty back together again may reach $375,000.

Casualties like the gilded punch cards and the Overland fire are pushing jittery management at large and small companies alike into audits of their computer security systems. The focus is on data, not hardware.

Many firms also are opting to keep a set of duplicate tapes and disks at off-site locations. An extra goad spurring use of these off-site locations is the increasing federal requirements for corporate retention of records; it's becoming impractical to retain all that data in-house for years on end.

Establishment and perpetuation of an effective information security system is a new and unfamiliar responsibility for corporate management. But as the above cases illustrate, the most valuable assets of many companies aren't plant and equipment or even inventories of raw material or finished goods.

Life Blood

Instead, they are the collection of magnetic tapes and disk files used by their DP facilities. These contain the data base and transaction information that are the lifeblood of the organization and assure that the business functions effectively and efficiently in a competitive environment.

Companies are seeking outside assistance and support services to help discharge management's responsibility for data security. A review of the outside services available turns up several companies geared to provide them.

One of these, headquartered in New York City, is Bonded Services. It has established what is believed to the first off-premises facility designed to safeguard DP magnetic media, developed an integrated system for providing information security and created an information system security audit.

Bonded Services specializes in information security as well as in retention, handling and worldwide distribution of all types of data records. These range from computer tapes and disks to video tapes and motion picture film, all kept at its principal facility – a 4-1/2-acre security complex in Ft. Lee, N.J., just across the Hudson River from New York City [CW, Feb. 16].

Trading Tornadoes for Earthquakes

What about on-site retention compared with such an outside service? Upon initially considering the problem, corporate management may conclude files can be suitably protected in-house.

The problem here is that the tape library – where current operating files are kept – fails to provide a suitably secure physical environment or the requisite access control. Additionally, if a disaster occurs, both master and backup files would be destroyed.

Some organizations have considered the routine exchange of selected files of tapes and disks with neighboring companies or with distant subsidiaires. But this approach fails to solve the inherent objective – ensuring the security of a vital corporate asset.

Rather, it lessens management's control over the files and merely shifts the locus of vulnerability. Moving tapes from headquarters in Kansas to a subsidiary in San Francisco exchanges the risk of tornadoes for that of earthquakes.

Corporate management's use of off-site security facilities is an important element in a company's information asset protection plan. This plan should be designed to assure the prompt and complete restoration of an organization's critical DP activities after a disaster.

How is such a plan created? What operating files are duplicated for retention off-site and what archival files are to be bundled up and removed without leaving behind any duplicates?

The Key to establishing this plan is the decision to undertake a wide-ranging security audit that examines critical DP activities and the requirements for maintaining data on-site. One result of the survey is a listing of files that contain essential information, plus a second listing of which of them are so vital they must be kept in-house and duplicates made.

CRU Devices Signal Failures by Alarm

CLEVELAND – CRU, a manufacturer of computer performance measurement hardware, has announced a line of digital devices that sound an alarm if any portion of a user's system fails to function.

The Sentry/360 alarm systems, designed for use on any manufacturer's hardware, were described by the company as the DP manager's equivalent to the railroader's dead-man switch.

Using digital logic, two or three probes and some software patches, the box collects a signal from the CPU, channel, frontend or whatever it is monitoring.

The Sentry/360 can be used to oversee any portion of a system, including the address/compare sync pulse, the digital equipment trace bit and console indicating lights, according to the vendor.

The alarm systems are priced at $1,000 to $3,000 from CRU at 4650 W. 160th St., Cleveland, Ohio 44135.

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Manager Initially 'Scared Stiff'

S&L Finds Move to Disk-Oriented System Saves Time

UPPER DARBY, Pa. – Tony Crane wears many hats at Greater Delaware Valley Savings & Loan (S/I) Association here.

Officially, he's an assistant vice-president. More precisely, he's in charge of all DP systems and services for the five-branch S&L.

And, in addition to being DP manager, he's assistant treasurer, manager of systems analysis and computer programmer.

Crane is currently training his assistants to work with the S&L's recently installed Univac 90/30 system with an able assist from Univac's John Doughten – a systems analyst who's there to help with the conversion to disk operation.

Together Crane and Doughten have been converting the S&L's operations to disks from the Univac 9200 system and unit record equipment previously used.

The disk-oriented system's speed is the main factor in processing at Greater Delaware. "Sorting 700 transactions takes 1 min," Crane explained. "We sorted a large file of approximately 50,000 records, and it took around 15 min."

'Scared Stiff' About Disks

Crane feels confident about the system now, but he didn't always feel that way. Like many people using DP for the first time, he had reservations: "I never worked on a disk system before," he said, "and I have to admit I was scared stiff.

"With cards, you could pick them up and look at the numbers. Since the disk is magnetic, you can't see the information on it."

The present installation at Greater Delaware's main office here services all accounts for the main office and four branches.

Soon to be added to the complex are two more branches obtained since a merger with another S&L association. Even with all of these growing pains, Crane said he is confident the disk-oriented system can handle the increased workload.

The basic system at Greater Delaware consists of the Univac 90/30 processor, which has 32K bytes of main memory; a card reader which handles 500 card/min; a card punch with an output of 75- to 175 card/min; a line printer with a speed of 400 line/min in alphanumeric mode; and two 8416 disk drives. With both drives operating, disk capacity is about 59M bytes. Also on-line is a Uniscope 100, which is used instead of a teleprinter.

Pleased With Speed

Cranc said he is pleased with the speed of the disk system. When he made inquiries at other computer sites, he was told a copy pack was very time-consuming, requiring some 25- to 45 min to run a security file copy.

"We're able to run a copy pack in 3 min," Crane claimed. "Running a copy pack in 3 min – well, that's just fantastic."

Speaking of another speed feature, Crane noted Greater Delaware compounds interest on every account on a daily basis; this daily updating and compounding can be handled in a 3-min pass, he said.

Since the system is still new to Greater Delaware, it hasn't yet been loaded with all the S&L's work. Passbook savings are all being handled by the computer. Next will come the club accounts, but mortgages and loans will take a while.

The mortgages are still being handled by an outside computer service, but nevertheless remain a high priority for conversion, Crane said.

Right now, the system is handling directly some 35,000 passbook accounts and 4,500 certificate accounts. Club accounts – 1,800 Christmas and 300 Vacation Clubs – are run in emulation on the 90/30 in card mode using a Univac 9300 system program.

"The emulation of the card system is working well," Crane said. "The only thing I don't like about emulation is that it's slower – maybe 75% of the speed of the 9200."

The 9200 card system was installed in 1970 and Greater Delaware used it until May of this year.

Each branch receives an updated trial printout once a week. The tellers are required to verify the trial balances during a window transaction.

"Tellers should verify the balance on all withdrawals," Crane stated. "They don't always do this – especially during the crush of a busy period and when the teller knows the depositor."

But once the S&L installs terminals in all of its branches with on-line processing, this type of verification will be easier, Crane said.

But "that's about three years away," he added. He expects the branch offices will be equipped with Uniscope 100 terminals.

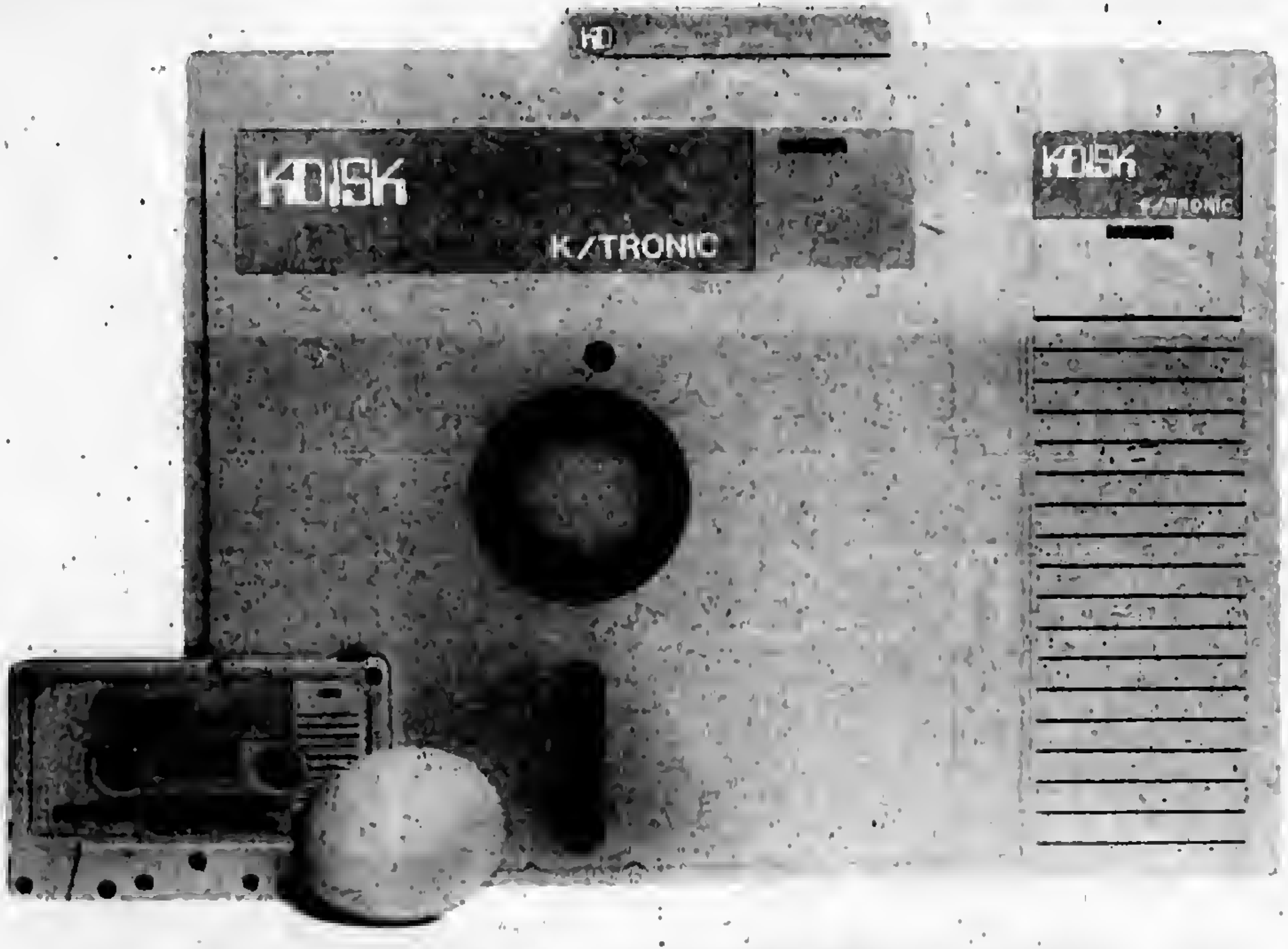
The trial balance – which is used now at the branches – lists the account number, the balance, the last transaction, the last transaction date and the accrued interest to that time. While tellers aren't usually required to check the printout for deposits, they are expected to do so at certain times of the year so interest earned can be credited in the passbook.

The greatest single source of errors is when tellers don't add interest to passbooks, Crane said. This type of error is picked up on the daily audit and notices are sent out to depositors so they can bring their passbooks into their branch for updating.

Other errors can include such items as a returned check not entered in the passbook or a deposit made without the passbook, he observed.

There are two types of loans at the S&L – savings account (passbook) loans and mortgage loans. The 4,000 mortgages are currently processed by each bank's DP system, but eventually will be pulled into Greater Delaware's computer system.

This will happen by January 1977; it will take that long because of prior commitments. Crane and his associates are now setting up the programs that will be used for this group of accounts when they're entered into the 90/30.



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Performs Numerical Simulations

Time-Sharing Center Aids Study of Nuclear Power

LIVERMORE, Calif. – A time-shared national computing center at Lawrence Livermore Laboratory here has been established to speed research in development of electrical power reactors fueled by the nuclear fusion process.

Lawrence Livermore Laboratory is operated by the University of California under contract to the Energy Research and Development Administration (Erda).

The computer network is anchored by a Control Data Corp. Cyber 76 system, with a CDC Cyber 70, Model 73 system utilized as a front-end. These are connected by high-speed communications lines to four remote user service centers, with more to follow.

Last year the laboratory was designated by Erda as the site of a national controlled thermonuclear research (CTR) computing center to provide most of the computing support for the theoretical, experimental and engineering activities of the controlled fusion program.

The center will perform numerical simulation of experiments intended to provide better understanding of the complex plasma interactions which occur during controlled thermonuclear experiments.

Results of these simulations will be used as the basis for further calculations in fusion plasma physics and in the design of experimental reactors.

The CTR program is aimed at generating controlled fusion reactions by producing and magnetically confining high-temperature, fully ionized plasmas of heavy isotopes of hydrogen. Controlled thermonuclear fusion is now widely accepted as one of the best prospects for a clean and safe supply of energy in the future.

Commercially available power generated by controlled fusion is at least 20 years away, but an experimental fusion power reactor generating about 100 megawatts of power is expected to be operable about 1985, according to Dr. John Killeen, head of the national CTR center.

Both Russia and Japan are aggressively pushing fusion programs, and both may very well have their experimental reactors operating some time before that of the U.S. The Russians are known to be devoting twice the U.S. resources to their program and are expected to have a commercial-scale, 500-megawatt demonstration plant in operation about 1995.

Once electrical energy from fusion power is available, the need for fossil fuels will diminish tremendously, because, Killeen said, "theoretically, a gallon of sea water contains the energy equivalent of 320 gallons of gasoline."

Enormous Computing Power

Erda scientists at Livermore said equations describing the behavior of plasma in CTR devices are so complex that they can only be approximately solved by analytical techniques presently available. Therefore, computer models must be used extensively to understand and predict plasma behavior.

While the results obtained to date have been of great importance in furthering the program, the computer codes still need extensive development and refinement in order to model realistic confinement plasmas, the scientists said.

Presently, good one-dimensional codes are available to follow different plasma qualities on different time scales. Idealized two-dimensional codes are now in the application stages, Erda said, and crude three-dimensional codes are in various states of development.

It is the need to develop these codes and others like them that brought the national CTR computing center into existence.

Small-, Large-Scale Systems

Small- and large-scale computers coexist in the distributive network, which is designed so that large jobs can be channeled to the big machines, and smaller jobs – a printing chore, for example – can be handled by a small computer at a remote user site.

The smaller facilities accomplish much of the locally required processing, relying on the large central computers for work such as large particle simulation and fluid calculations.

The network is so designed that when a small remote computer cannot complete a calculation, it automatically calls upon the Cyber at Livermore

First to go on-line with the CTR center have been three major laboratories and one private contractor: Oak Ridge National Laboratory in Tennessee, Los Alamos Scientific Laboratory in New Mexico, Plasma Physics Laboratory at Princeton University and Gulf General Atomic in La Jolla, Calif.

Two laboratories at Livermore are served by the computing center – one used by the scientists engaged in controlled thermonuclear research and one that provides operational access by the CTR computer center personnel. Other remote installations are due to follow.

The Cyber 76 computer provides the main computing power and the Cyber 73 system handles the communications load, acts as a file transport between remote sites and manages the large centralized data base.

Each of the remote user service centers utilizes a Digital Equipment Corp. Decsystem-10 computer to provide local computational support and to communicate over 50 kbit lines with the Livermore center through a DEC PDP-11 computer and a complement of I/O devices.

Terminals at the remote user sites and the host laboratory include a mix of 30 char./sec electrostatic printers, interactive CRTs with alphanumeric keyboard and graphic/alphanumeric displays operating at 9,600 bit/sec.

User-Created Files

Files, stored under a Livermore-developed program called Filem, are user-created. These files are managed by the CDC Cyber 73 computer and are retained on disk and then purged to tape after a predetermined period of nonuse. The Cyber 73 maintains an index, and a request for a purged file brings the data back on to CDC 844 disks. A mass memory, planned for later this year, will replace the tapes to some extent, but tapes will remain as backup.

The data communications portion of the network is controlled by a DEC PDP-11 used as a concentrator. File transport and terminal traffic flows site-to-site through this network. Communication with the Cyber 76 computer can also be handled by direct dial to a concentrator at Livermore.

A growing number of universities are receiving funding by Erda for fusion research, and private contractors are expected to enter the program as feasibility becomes further established. These new participants, as well as a number of university laboratories presently in the program, will be served by the network.

While terming the new computing center a tremendous help in hastening the day of practical fusion power, scientists at Erda pointed out that the more they learn about the behavior of plasmas, the more computing power they will need.

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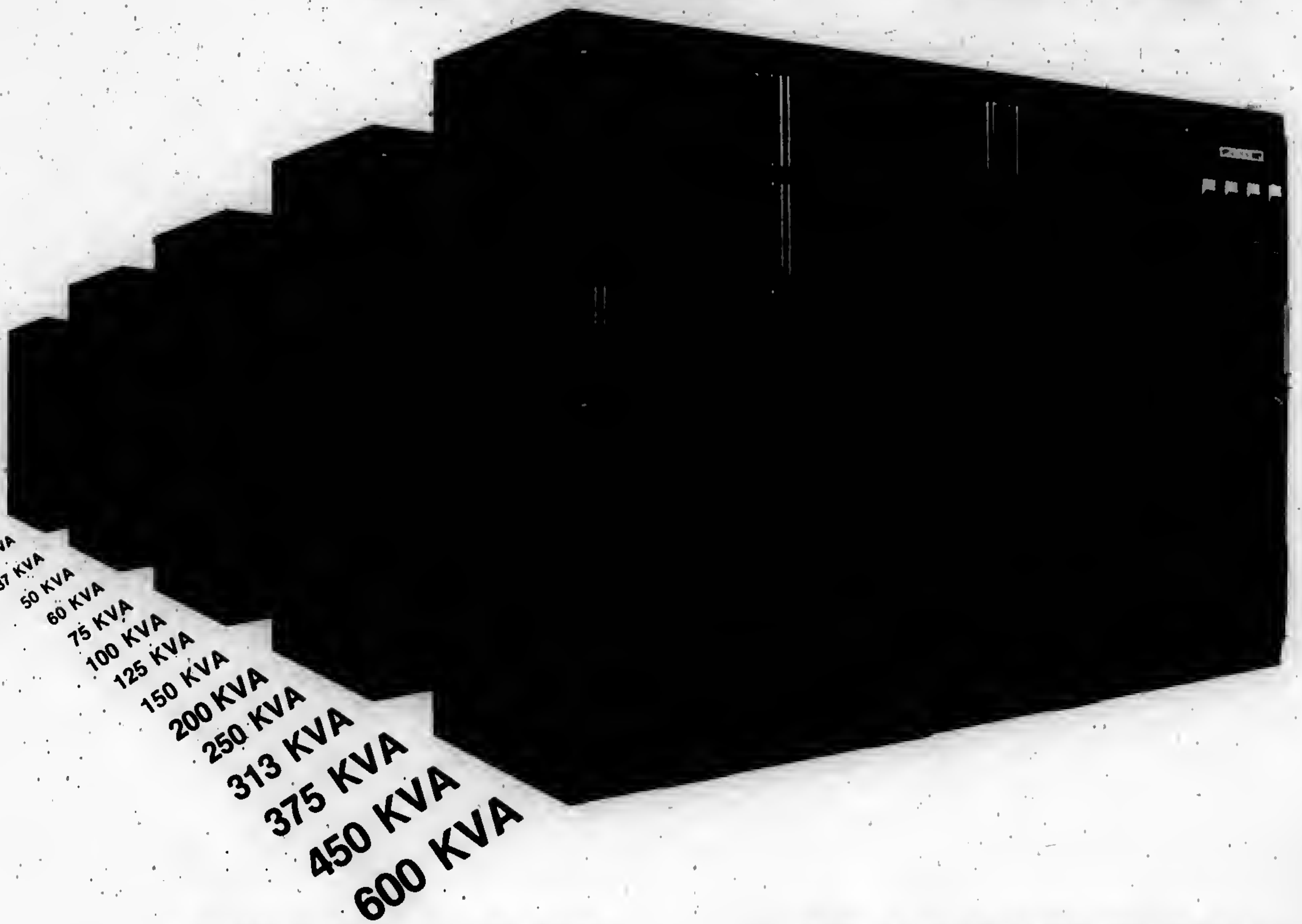

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'Security Kernel' Developed to Help DP Keep Secrets

BEDFORD, Mass. – A package smaller than the proverbial bread box, called a "security kernel," may solve a perplexing problem that faces computer users – how to keep a secret.

The Electronic Systems Division (ESD) of the Air Force Systems Command and the Mitre Corp. here have developed this security kernel, which is a combination of hardware and software that controls access to information within a computer.

The kernel prototype has been running at Mitre for more than a year.

According to Lt. Paul Karger, systems design engineer in ESD's Computer Security Branch, "a key factor of the kernel is its ability to control release of information by effectively ensuring that a user's clearance is adequate for the information requested.

"Security checks in current computer systems are dispersed throughout the system, making it virtually impossible for its security to be guaranteed," he said.

"However, in a system with a security kernel, security functions are centralized and isolated, so it's possible to prove that it is penetration-proof."

Because there are "no effective automatic internal security controls" in today's computers, Karger continued, "the military is forced to protect information in computers by physical and procedural means – for example, by processing only one security level. Computer systems may be changed from 'secret' to 'top secret,' but only after going through time-consuming clearing operations.

"These procedures result in inefficient use of equipment and manpower and the separation of various classifications of information often requires the purchase of more computer hardware than is necessary," he added.

Grim History

The history of computer security is grim, Karger said, and keeping secrets in computer systems is recognized as a major problem by both industry and the military.

Numerous instances of successful tamperings or breaking of computer security programs have been recorded. Some of these have been made by an ESD "tiger team" composed of officers from the Computer Security Branch of the Deputy for Command and Management Systems and Mitre computer experts.

The team has broken several computer systems, including the Honeywell Multics which was initially highly publicized as "secure," Karger said.

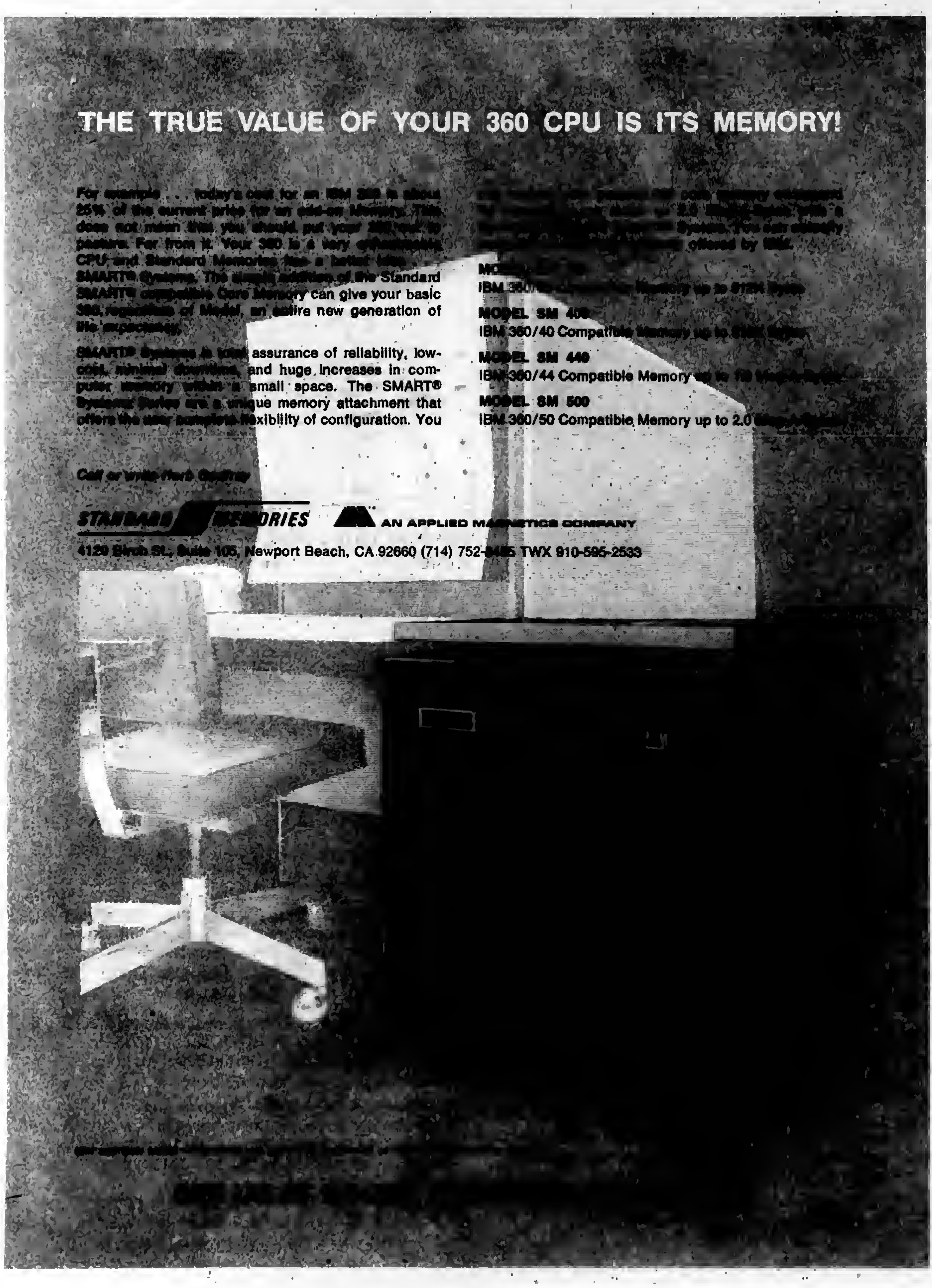
But penetration exercises only show the existence of vulnerabilities in a system and do not confirm its security. Even though a weak spot may not yet have been discovered, further attempts could find one, he added.

In 1971 ESD was given the problem of developing a multilevel computer system, i.e., one that could simultaneously process two or more levels of classified Information, from "unclassified" through "top secret," for users with different clearances. The system had to be certified secure for Air Force use.

To accomplish this task, ESD contracted with Honeywell Corp. to develop the technology needed to secure computer systems and to meet the strict validation requirements of the Department of Defense.

Based on its studies of the Mitre security kernel, Honeywell is developing a security kernel for a large Multics general-purpose computer which allows immediate information sharing. Prototype testing of the secure Multics computer is planned at the Air Force Data Services Center in Washington, D.C., in 1979.

ESD is also sponsoring with Honeywell the development of a secure military minicomputer. Potential applications of secure minicomputers as components of Air Force systems include such systems as the Strategic Air Command . Total Information Network, the Air Force Satellite Communications and E-4 (airborne command post).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MSI Line Printer Produces Labels

COSTA MESA, Calif. – MSI Data Corp. has introduced a medium-speed line printer for printing alphanumeric data and the MSI Bar Code on shelf labels, merchandise tags or other forms.

The Model 3150 does not, however, print the Universal Product Code, a company spokesman noted.

Designed to be controlled by an MSI Data System IV receiver, the printer works off-line and is aimed at the user who wants to save money by generating bar code labels in-house, the company said.

For the user that already has a Data System IV, the printer costs $13,200. The printer with the tape drive costs $35,000.

The Model 3150 will be available in July from the firm at 340 Fischer Ave., Costa Mesa, Calif. 92627.

Single Bus Marks Design Departure

Harris Unveiling Slash 6 for High-Performance Users

By Esther Surden
Of the CW Staff

NEW YORK – The Harris Corp. Slash 6 minicomputer being unveiled at the National Computer Conference (NCC) here this week was designed for high-performance, real-time applications, the vendor said.

Featuring a single-bus design and microprogrammed architecture, the system represents a different hardware approach for the firm, a spokesman said.

Incorporating a 4-bit microprocessor and MOS memory, the Slash 6 is said to be fully software-compatible with the other members of the Harris Slash series. It will eventually replace the Slash 4 system, according to the spokesman.

With the Slash 6, Harris has increased the effectiveness of the Slash 4's I/O structure by implementing a block-oriented direct to memory I/O operation for high-speed devices, the spokesman said.

An 8-bit programmed I/O channel is available for slow-speed character-oriented devices, he added.

System Size Reduced

The system CPU, which incorporates six 4-bit bipolar microprocessor chips, a programmable read-only memory (Prom) bootstrap and eight priority interrupts, is packaged on a single multilayer printed circuit board, the firm said.

This has significantly reduced the Slash 6's size compared with the Slash 4, which uses seven boards, the spokesman added.

Effective processor cycle time is said to be 600 nsec.

Two programmer panels are available for the system. The full panel provides switches to monitor and modify the contents of registers and memory; a turnkey panel was designed for applications not requiring the full panel, the firm said.

The heart of the Slash 6 is the system bus that features 48 lines for data and 18 lines for addressing, with all major system elements communicating asynchronously through it to and from memory, the firm said.

The I/O system design allows peripheral controllers and associated devices to be shared between multiple processors, according to Harris. The semiconductor memory uses an 18-pin 4K random-access memory (RAM) which allows packaging of 48K bytes on a single board.

Single-bit error correction using 5-bit code is a standard feature, the firm said, and memory is expandable in 48K-byte increments to 768K bytes. The 24-bit word is used throughout the Slash series.

Floating Point Optional

An optional Scientific Arithmetic Unit (SAU) is offered for high-speed, floating-point arithmetic operations. The SAU instruction set includes double-precision, square-root and inverse arithmetic functions in addition to floating point-to-integer and integer-to-floating point conversion, the firm said.

The Slash 6 can use the complement of peripherals available with other Harris systems, the spokesman said.

Operating software for the system includes the Disk Monitor System, which offers a concurrent foreground/backgound capability, the Disk Operating System, Tape Operating System and Resident Operating System.

The instruction set for the system was described as "comprehensive," with over 120 generic instructions yielding 658 individual operations.

The Slash 6 with 48K bytes of MOS memory costs approximately $14,500; first shipments will be made in August, Harris said from 1200 Gateway Drive, Fort Lauderdale, Fla. 33309.

Canadian Dealer Implementing Mini-Based Net For On-Line Order Processing, Inventory Control

VANCOUVER, B.C. – Finning Tractor and Equipment Co. Ltd., a large dealer of heavy equipment, is implementing a massive order-processing, inventory control and communications message-switching network using minicomputers, the user said.

Finning, which carries a $15 million parts inventory of about 150,000 line items, has 25 parts operations located in British Columbia and the Mackenzie Valley of the Northwest Territories. Each operation maintains its own inventory, and parts stock may vary from one to the other.

Two Data General Corp. (DG) Eclipse C/300 computers will act as the central system for a real-time interactive network of Nova-based systems located in the remote operations. The network will give the firm an up-to-date record of all parts of stock and tell partsmen which locations have a required part on hand.

This information will give partsmen in each location access to parts stocked anywhere in the organization and let them tell the customer when the parts can be delivered, Finning said.

Every location will have an intelligent terminal system made up of a Data General Nova 2 with 32K-byte main memory, two or more CRT displays and one or more 165 char./sec line printers.

Each terminal system will be connected to the central Eclipse system here in Vancouver by dedicated synchronous lines. Each operation will be able to access the Eclipses to determine what parts are available elsewhere.

C.A. Harris, Finning's DP manager, noted that the ability to rapidly process a parts order is important in the heavy equipment industry. "The machinery is a large capital investment and cannot be idle for any length of time," he said.

Number of Uses

"There are a number of things our people can do with the system," Harris said. "A partsman out in Kamloops, for instance, can determine which parts department has a specific part in stock. The system will tell him that it is in, say, the Prince George and Vancouver locations.

"This information lets the partsman compile a complete purchase order line by line, no matter where the parts may actually be located," he continued. "Once the purchase order is completed, the central system will remove the parts from inventory, cut an internal shipping order or order out-of-stock parts from the

(Continued on Page 68)

Pertec Bringing Passel of Peripherals to NCC

NEW YORK – Pertec Corp. will release a passel of OEM minicomputer peripheral products at the National Computer Conference (NCC) here this week.

Among the entries are a series of tape transports that operate with 48 Vdc batteries; 12M- and 24M-byte dual-platter fixed disk drives additions to the Pertec D1000 series; 25M- and 50M-byte disk drives for the D3000 series; and a series of "advanced design" vacuum column magnetic tape transports.

The tape transports, with formatters, were designed for use with uninterruptible systems that use batteries recharged by regular ac current as the primary power source, Pertec said. The units are based on the vendor's T7000 and T8000A digital magnetic tape transports.

A 48 Vdc-to-dc converter can be added to the transport as well as optional formatters and buffers, the firm said, adding the converter costs $300 over the standard price of the T8000A and T7000 units.

The 12M- and 24M-byte dual-platter fixed disk drives were added to the D1000 family, which includes the single-platter D1400 and D1600 drives.

The 24M-byte unit, called the D1660, features two IBM 3336-type nonremovable platters with a 4,400 bit/in. bit density and a 200 track/in. track density. The 12M-byte D1460 has two IBM 2316-type nonremovable platters with bit density of 2,200 bit/in. and track density of 200 track/in.

The D1460 costs $2,085 and the D1660 is priced at $2,710 in OEM quantities, Pertec said.

Extensions to the firm's D3000 series include 25M- and 50M-byte disk drives with four platters (three fixed and one removable cartridge) with each platter individually write-protected, Pertec said.

The D3400E and D3600E permit OEM designers to increase system storage without major redesign, the firm claimed.

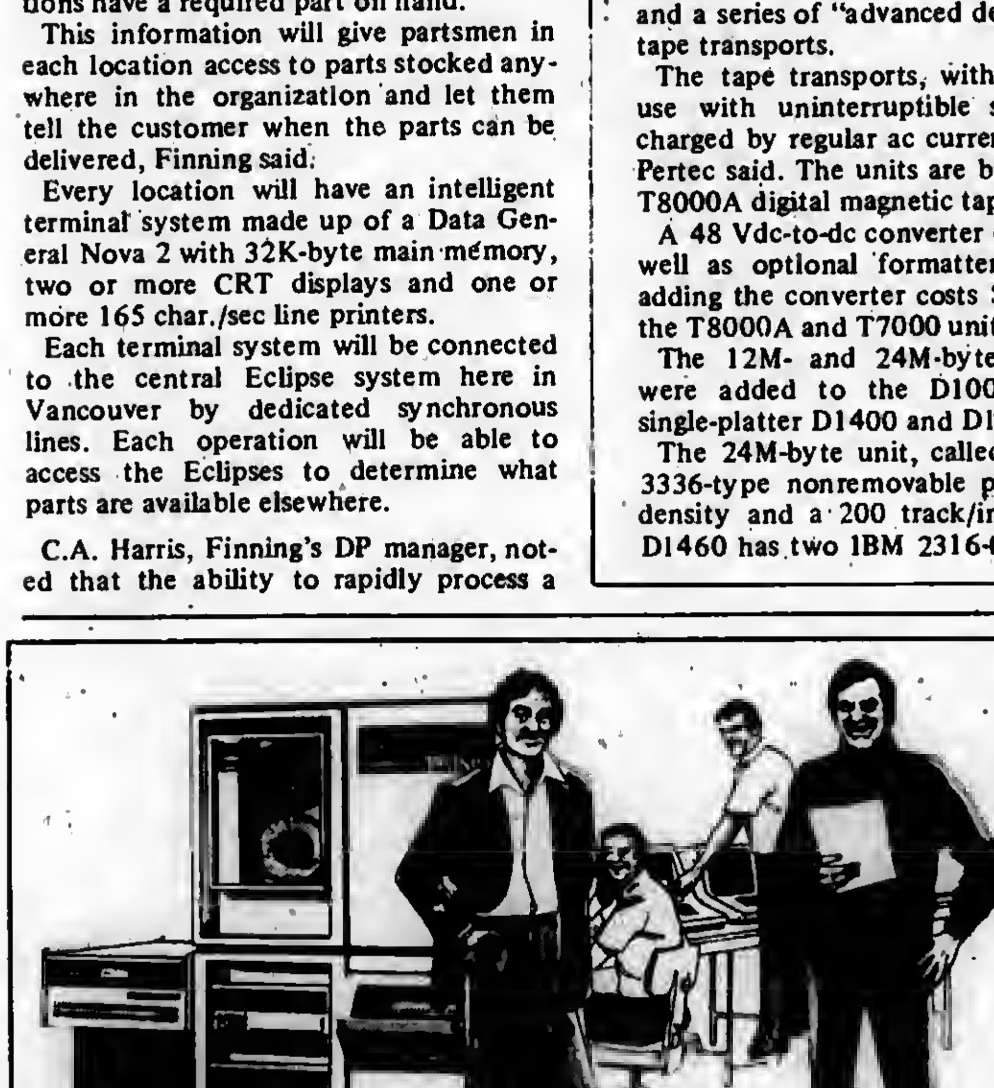
The 50M-byte D3600E features 4,400 bit/in. bit density and 200 track/in. track density; the 24M-byte D3400E unit has a bit density of 2,200 bit/in. and a track density of 200 track/in.

The D3400E costs $4,260 and the D3600E is priced at $4,420 in OEM quantities.

The T1000 vacuum column magnetic tape transport features speeds of 75- to 125 in./sec, autoload tape threading, modular electronics and built-in self-testing, the firm said.

Standard features include dual-format 800- and 1,600 bit/in., read-after-write hard coated heads. Air bearings were designed in at all turnaround points, Pertec noted.

The T1000 costs $4,955 in OEM quantities, the firm said from 9600 Irondale Ave., Chatsworth, Calif. 91311.



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PRIME

Handles Accounting Functions

Rising Bureau Costs Push Firm to In-House System

By Esther Surden
Of the CW Staff

COMPTON, Calif. – Rising costs at a service bureau convinced Strolee of California here to switch its data processing to an in-house system, DevaDas Lon, DP manager, said in an interview here.

However, when trouble developed with the NCR systems they had installed, the firm had them removed and went with Basic/Four Corp.

Service bureau costs had risen from an original quote of $1,600/mo to $7,000/mo, Alvin I. Levine, controller, said. So in late 1974 the firm decided it needed a minicomputer to control its accounting functions, especially its accounts receivables.

Two NCR 399s were rented and "we controlled what we wanted to control," Levine said.

However, when the firm decided it was time to convert to general ledger, the accounts receivable system went down.

Strolee kept trying to get the accounts receivables going and had even ordered an NCR 8200 to upgrade, but when continuing problems were not resolved, Strolee had the systems removed, Levine said.

Examined Alternatives

The firm then examined the alternatives open to it by talking to many mini vendors and telling them it wanted to purchase within 30 days. Only Basic/Four and IBM were responsive, and the IBM 3 was eliminated because of cost, Levine said.

The firm's software was converted at the Basic/Four dealer's office before the system was installed, Levine said. The company has a Model 600 with 20M bytes of disk, 56K of core, four CRTs, one medium-speed and one 300 line/min printer, Lon said. It cost about $100,000.

"The system has increased customer service from a four-week to a 2-1/2- week period without substantially increasing inventory," Levine said.

Strolee manufactures nursery items such as strollers, high chairs and playpens. The firm averages 80 orders per day, 15 line items per order, Lon said.

Two computer operators work with the system, one during the day and one at night. The night operator runs the specialized reports needed for management decision while the other does order entry.

Packages run on the system include accounts payable, receivable, payroll, order entry, a finished goods inventory system, requirements reporting and sales analysis. The on-line inquiry capabilities are considered very important to Strolee.

The system allows Lon to change programs and fix bugs on-line, he said.

The reports available to Levine are very important in running the business and making management decisions, he said. Reports are produced at his direction and can tell him, for example, if shipping to a customer costs more than the profit made by selling, because of the profit margins on certain items, he said.

Sales analysis by salesman, state, company, etc. is also provided by the system.

"I am running more applications on my Basic/Four system than some 360/40 shops," Lon concluded.

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(Continued from Page 67)

manufacturer."

As the various remote operations tie into the network, the C/300 systems will automatically add and subtract items from any inventory.

"We are making the system as easy as possible for the people in the other locations to use," Harris said. "The CRT terminals there will display a fixed format for inquiry. At the headquarters, each operational department will have a terminal from which it can do a number of operations, provided it has the proper security code."

The system will replace Finning's existing TWX and Telex networks, Harris added. "The synchronous line between locations eliminates the need for these outside services for interoffice communictions," he said.

The firm chose the DG systems after considering Honeywell, Digital Equipment Corp., Hewlett-Packard and IBM because they seemed to have a better "cost performance ratio," Harris said.

When the system is fully implemented, the entire company data base, including items such as customer and personnel files, as well as parts will be stored on the 256K-byte Eclipse C/300 systems' two 100M byte disk storage units.

"One Eclipse system will be running on-line," Harris said, "while the other will be used as a 'hot' backup and for software development."

The network software, designed and implemented by Finning, will provide communications facilities between any user processes regardless of location.

Application programs are written in a version of DG's Fortran 5, modified to support commercial data variables, Harris said.

With all data in central disk storage, authorized personnel will have access to the total pool of company information. The credit manager, for example, will be able to retrieve a customer credit profile which includes customer accounts receivable, payment history, purchase volume and monthly statements.

Similarly, the personnel department will have access to information like wage and salary, employee benefits and employee turnover.

Finning plans to implement the central Eclipse C/300 system in stages. Until that system is fully operational, inventory management and other jobs will continue to be run in a batch mode on Finning's Honeywell 2000 series system. The Honeywell mainframe will be kept for batch processing after the minicomputer network is implemented, Harris said.

The entire network hardware cost about $1 million with about $200,000 in software development costs estimated.

Mini-Based System Helps Put Hospital Back in Black

DAYTON, Ohio – In less than a year, Grady General Hospital here went from a deficit of nearly $23,000 to a profit of nearly $200,000 by applying sound accounting practices and a small business computer to its paperwork load.

But the IBM System 32 and its basic hospital accounting package was not enough, according to Penny Beale, Grady's assistant administrator.

Source documents in use throughout the hospital had to be updated for efficient data collection and input operations.

For this, the hospital called in specialists from The Standard Register Co., she said.

Grady started with 36 beds in 1960 and expanded to 48 in 1968. Until the early 1970s, the hospital and the city's four general practitioners seemed sufficient, Beale explained.

As plans were made to enlarge the hospital to 60 beds, add a new 35-bed unit to replace an old wing and bring in many new ancillary services, it became obvious that procedures used to maintain records and handle paperwork had to be improved.

Recordkeeping was taking trained personnel away from their prime job of patient care, she said.

At that stage, everything was done manually, using standardized forms for charge slips, bills, statements and checks, she said; the only concession to machine assistance was a double-entry posting unit for billing and ledger purposes.

Source Data Problem

Although the hospital decided a small computer would solve many of its problems, it did not solve the problem of preparation of source data, she said.

"We quickly found there were no effective stock forms for the input system," she said.

At this point the hospital called in Standard Register, a firm that specializes in hospital paperwork functions.

The first phase in conversion addressed itself to requisitions, charge slips, admission paperwork, patient billing and specialized third-party billing.

To avoid as much confusion as possible, the hospital wanted new procedures to follow the old as closely as possible, Beale said.

With cooperation from all the departments, the business office, the administrator and a Standard Register health care systems specialist, the company formulated a series of 21 charge slips and related forms used in major activities.

Although the forms presently call for manual entry of charges, the hospital is currently working toward an internal pricing system in which simple codes will trigger the release of correct pricing system in which simple codes will trigger the release of correct pricing from the computer, she said.

Most forms provide copies for lab or ancillary service, the patient's chart, the doctor, the department's file and data processing, she said.

The top copy is an instruction sheet that must be read before the form is completed.

Patient information is imprinted with embossed plastic plates, but information may be handwritten when one is not available, she said.

Two-part charge slips cover functions such as room transfers, discharges, credit memos along with certain services and charges including those for anesthesia, operating and recovery room use, intravenous solutions, labor and delivery room use and respiratory therapy. All these forms, along with the four-part lab test request forms, contain a copy for data processing. The other copy may be for the chart or for department use, she said.

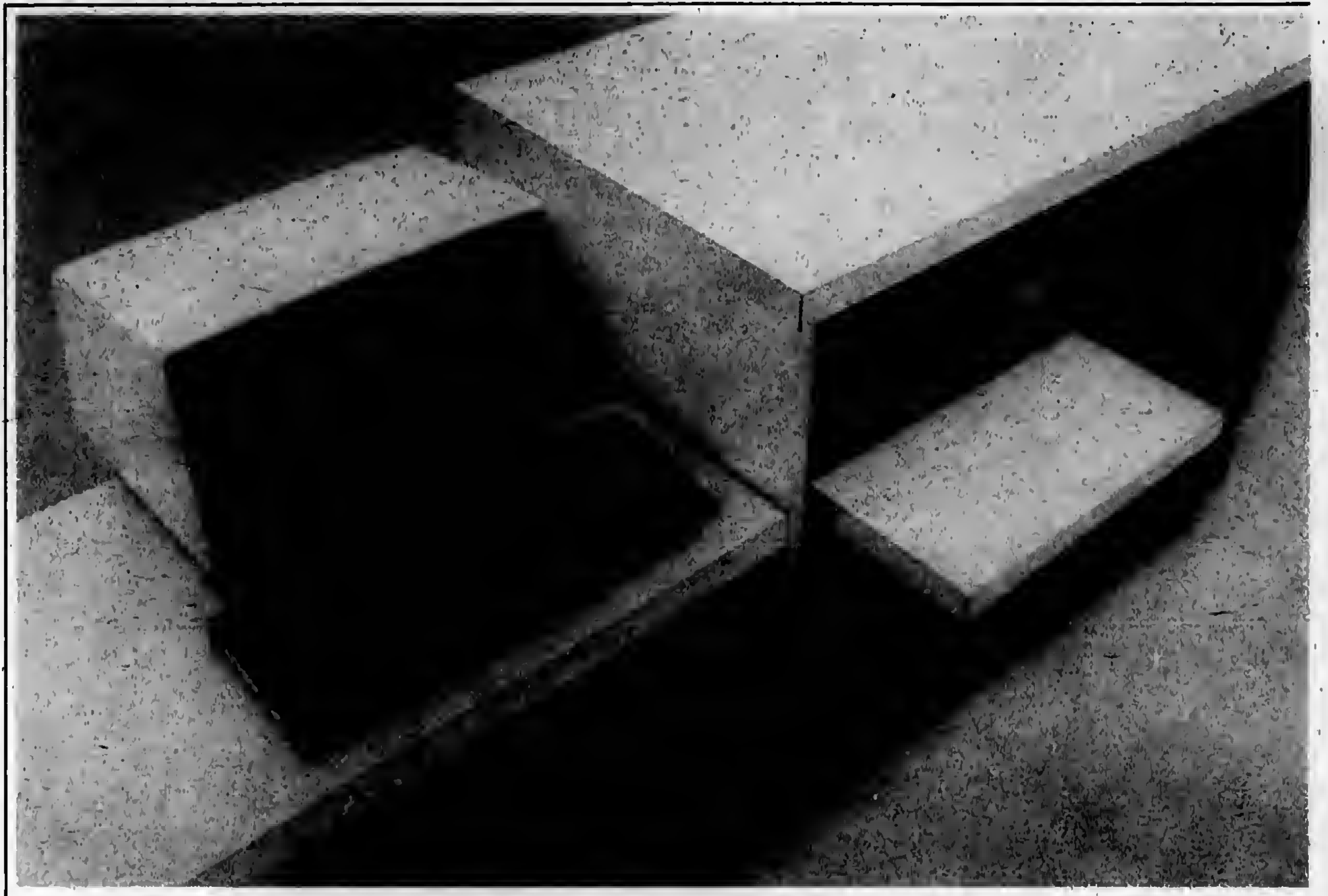
These forms were designed to incorporate as much preprinted information as possible, making it easier, faster and more accurate for nurses or ward secretaries to enter the necessary information by checking boxes.

As the internal pricing system is brought into play, these forms will be changed to reflect the new information needs of a code system, which will provide even more efficiency, she said.

Because of changes in accounting practices, it is impossible to pinpoint the source of our gains, but the fact that gains have been made assures us that the system and the forms that provide the necessary controls are at the heart of the improvement, Beale said.

Because of improved input documents and associated procedures, as well as the equipment efficiency, we are getting reports we didn't know were even possible before, she said.

Nurse completes treatment data for entry into Grady's mini.



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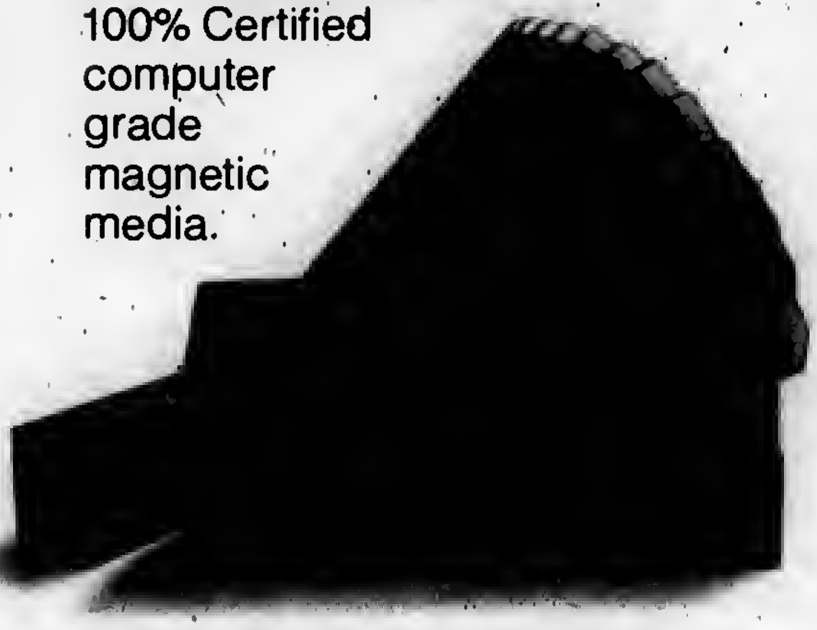

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Moving-Head Disk System Provides 9.9M-Byte Mass Storage For Nova

ANAHEIM, Calif. – An embedded controller and moving-head disk memory system for Data General Corp. Nova minicomputers has a mass storage base expandable from 2.4M bytes to 9.9M bytes, according to its vendor, Datum, Inc.

Called the 4091-N, the system handles one to four disk drives with a single controller, the firm said.

The Datum controller requires one slot position in the mainframe and is designed to be fully transparent to and software-compatible with the Nova computing system, the firm said.

Either 5540-type top-loading units or 2315-type front-loading units can be accommodated, Datum said. Average access time is 35 msec, providing a transfer rate of 312 kbyte/sec.

In single units, the 5091-N controller and cabling costs $2,900, while prices range from $2,900 for the controller with 5M bytes of storage and a fixed disk to $7,800 for the controller with 10M bytes of storage and one fixed and one removable disk, either top-loading or front-loading, a spokesman said from 1363 S. State College Blvd., Anaheim, Calif. 92806.

Microdata Giving Reality 'Face Lift'

IRVINE, Calif. – Microdata's Reality line is in for a "face lift" as well as some software enhancements in the near future, a company spokesman said here recently.

Reality is Microdata Corp.'s turnkey hardware and software system designed for small business applications. The systems are sold through dealers who provide the software support.

The firm has just opened a new group to handle "specials" for users who need nonstandard products or customized systems, he noted.

The "face lift" involves some system repackaging for office aesthetic purposes.

Microdata just recently completed testing on a software package that will allow bisynchronous communications on Reality; the systems would become IBM 2780 emulators.

A 600 line/min printer will be added to the product soon, he said.

Software releases that will increase Reality's throughput are the main thrust of the recent software development. RPG-II will be released for the system this month, the spokesman added.

Enhancements will allow data entry in Microdata's English language, while now the user has to use Basic or Assembly language to enter data, another spokesman added.

Also in the near future, Reality's core capacity will increase from 64K to 128K, he said.

Quantex Launches Tape Transport

PLAINFIELD, N.Y. – The Quantex Division of North Atlantic Industries, Inc. has introduced a digital tape transport that operates at 75 in./sec or 120 byte/sec at 1,600 bit/in. featuring the firm's "Floating Shuttle" principle of tape buffering.

The drive uses a lightweight shuttle to buffer the tape during start and stop operations, a spokesman said, to achieve speeds "formerly the exclusive province of vacuum-column-buffered design."

The transport handles tape reels to 10-1/2-in. diameter, accommodating up to 2,400 feet of computer-grade 1/2-in. magnetic tape. Rewind speed is 300 in./sec.

The capstan accelerates and decelerates the tape in 5 msec. Standard recording modes are 800 bit/in. NRZI or 1,600 bit/in. phase-encoded, providing either 7-track or 9-track operation. Tape speeds between 25 in. and 75 in./sec can be accommodated, Quantex said.

Interfaces are available for the major minicomputer families, the firm said.

The drive costs $4,400, with quantity discounts available. Delivery is approximately six weeks. The division is located at 200 Terminal Drive, Plainview, N.Y. 11803.

Interdata Systems Get I/O Converter

FORT LAUDERDALE, Fla. – The RTP7410/63 I/O bus converter from Computer Products, contained on a single printed circuit board, plugs into half a controller slot in the Interdata, Inc. models 70, 74, 80, 7/16, 7/32 and 8/32, the firm said.

The bus converter allows the firm's RTP family of analog and digital I/O measurement and control equipment to be operated under the control of the Interdata mini using standard I/O instructions.

Up to eight RTP controllers can be connected to one converter in chain fashion.

The bus converter, including one RTP I/O Bus Cable Termination Card, costs $450, and delivery is 45 days, the firm said from 1400 N.W. 70th St., P.O. Box 23849, Fort Lauderdale, Fla. 33307.

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Machines Used in Range of Applications

Prices, Sizes Seen as Only Things Small About Minis

The following is an excerpt from a talk recently presented to the Eastern Iowa Chapter of the Data Processing Management Association (DPMA).

By A. Gordon Holmes

Special to Computerworld

Minicomputers are being used in a variety of applications ranging from stand-alone systems in small- and medium-size businesses to networks of distributed processing in large business environments.

Networks or distributed processing came into use by applying the principle of division of labor to data processing. Now, central or "host" computers concentrate on the big tasks, and other machines handle functions such as data entry, data formatting, message switching, talking to other terminals and performing what other chores they can, but handing off the heavy work to the host.

Such a network may be composed of one big mainframe and a number of minicomputers and can provide more processing power than could possibly be built into a single machine – and at a far lower cost.

Networks like this also have the advantage of locating the processing power where it is needed. The trend toward distributing data processing is furnishing a strong lift to companies that make components for such systems.

This article will be limited mainly to equipment manufactured by companies such as Digital Equipment Corp. (the so-called "IBM" of the minicomputer manufacturers), Hewlett-Packard Co. (HP), Data General Corp. (DG), Microdata Corp., Modular Computer Systems, Inc. (Modcomp) and several others.

There are too many to attempt to enumerate them all here, but basically they all make good sound, solid machines that provide a remarkably good price/performance ratio.

The only things that are small about these minicomputers are their sizes and their prices. They come in memory sizes ranging from 4K to 1M bytes of memory. In most machines, this consists of 2-byte words.

I might point out that 32,767 is the highest addressable location using a 16-bit register. This is overcome with dynamic mapping, which allows programs to reside in memory above 32,767, but to execute only in the first 32K of memory. These programs, though, are swapped in and out of memory at core speeds of 500- to 1,000-nanosecond cycle speed so that a user realizes virtually no degradation.

Standard Peripherals

These machines come with all of the standard peripheral devices such as printers, card readers, paper tape readers and punches, magnetic tapes, plotters, card punches, CRTs, disks, etc.

All of these devices come in a variety of styles and speeds and most are built to be either stand-alone units or desktop units. The disk units are normally provided in 5M-byte or 10M-byte units; however, they can be increased up to 300M- to 400M bytes.

The guts of any computer system, though, comes in its operating system. These minicomputers come with a wide range of operating systems: single-stream DOS, partition DOS, real-time or multiprocessing executives, time-sharing and others.

Single-stream DOS is the traditional batch processing which effectively divides prepares batches of data off-line and submits them to the computer for one big run.

Partition-type DOS is a variation of batch processing which effectively divides the computer up into two, three or four computers and allows multiple program operation, provided a user has sufficient peripherals to perform the job mix.

Real-time or multiprogramming executives are operating systems which respond in real time, meaning now. It is geared to respond to an outside stimulus whether it be from a machine or process it is controlling or from a human in the DP department.

Typically these systems have the ability to schedule programs for execution at a particular time and then to repeat execution at the end of an elapsed time. This provides the ability for the program to execute and then go to sleep every so many seconds, minutes or hours, thus providing a continuum of real-time responses.

Time-sharing is a system somewhat similar to the partition-type operation in that it divides the machine and its resources (typically disk storage) into many pieces and makes each piece available to the user. As long as resources hold out, users are virtually unlimited.

The minicomputer manufacturers typically do not provide much in the way of applications software. However, one area of notable exception is in data base management.

For example, HP provides a data base management system called image, which has a report generator-type language called Query.

Image does a very commendable job of filing and retrieving data and Query will allow the formatting and preparation of simplistic inquiries and reports.

DG provides a system called Infos on its C-300 computer. Infos is not a data base management system per se, but it is a very efficient, high-level file manager which allows for fast, efficient retrieval of information on a record-by-record basis. It does not have any report-generation capability.

Microdata has the Reality system and a language called English. Here again is a true data base management system which very efficiently handles the storing and retrieval of information.

Microdata has also done something else with its Reality system. It has put all its software into firmware with the exception of a 4K monitor. This means no 'sys-gen,' as it is known today, and it means software now operates at true hardware speeds.

Holmes is president of Scoho Enterprises, Inc.

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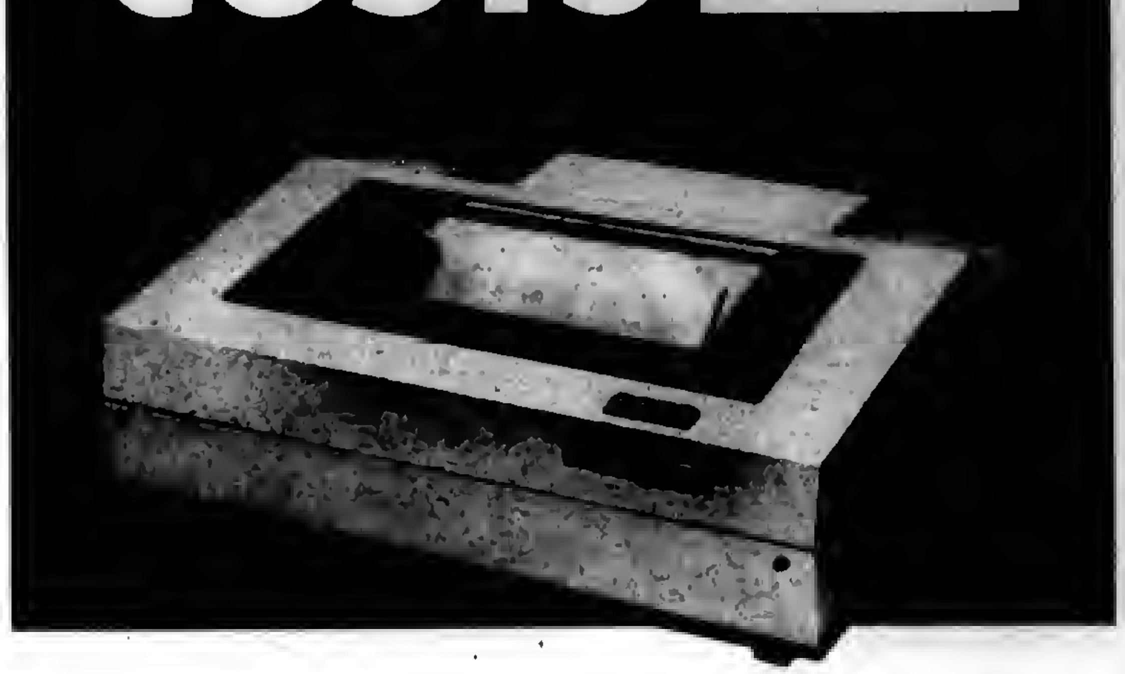

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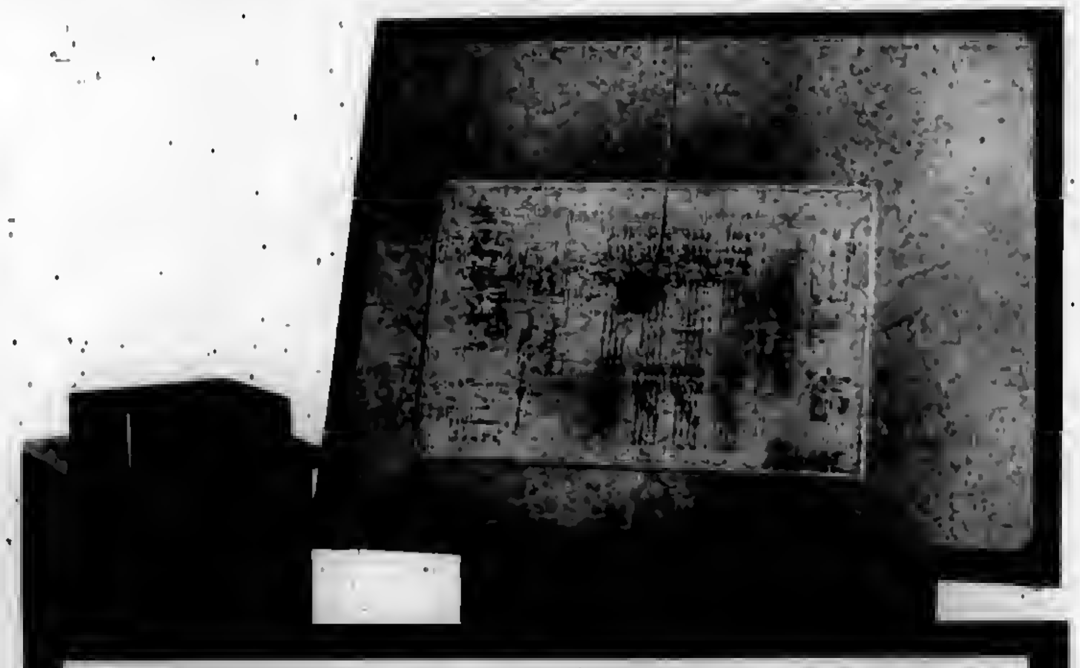

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Dealer Finds 'Canned' Software Satisfies Needs

SOUTH SAN FRANCISCO, Calif. – A photo accessory dealer here found "canned" applications on a small business system to fit his needs at a fraction of the cost to develop them in-house.

"Photo Sales International (PSI) is unique," Allan Gamson, the firm's president said, "and the fact that we turn over 70% to 80% of our photo accessory inventory every week or two provides us with some distinctive and unusual business problems.

"When we decided to computerize our previously manual operations, we explored the possibility of developing applications software unique to our situation. We started that evaluation from a much different base than most companies our size: my wife had programmed large-scale computers; and our consultant has a degree in macrocomputing.

"And yet," Gamson continued, "we settled on Qantel's package for wholesale distributors, 'Solution.' Our reason was relatively simple. It would have cost us $150,000 to $200,000 to duplicate the features already in 'Solution,' which sells for a fraction of that amount.

With the kind of cost differential posed, it was more economical to forego complete individuality and operate within the context of Qantel's package."

PSI settled on Qantel's low-priced System 900 coupled with 'Solution.'

The three-year-old distributor is now considering another video display terminal and upgrading to System 950.

Presently, the firm has the Model 900 with 12M bytes of disk, a CRT and a Centronics Data Computer Corp. printer. The system cost about $33,000 when the firm bought it last October, Gamson said.

At PSI, the operator enters the customer's identification number and 'Solution' fills in the rest of the details: customer name, billing and shipping addresses and any discount categories that apply for photo accessories ordered. Line items are handled in the same way, with 'Solution' providing item descriptions, unit price details and extension values after the product identification number and the unit quantity are entered.

After entry, the operator can obtain high-speed, quality printouts of the orders (including back orders and return orders) or order summaries. The items within each order are printed in sequence of warehouse location to provide a convenient "picking list" when the order is filled. The operator can also change or cancel entire orders or line items within orders or inquire into a customer's file to check on outstanding orders, Gamson said.

Just as with order entry, PSI's operators enter only one number – the order number – to activate the invoicing and accounts receivable features of 'Solution.' One-step invoicing permits the entry of new invoice information and credit or debit memos, directly to the accounts receivable file without going through order entry steps. Cash receipts and adjustments are also applied directly. Once entry is complete, PSI uses 'Solution' to print invoices and summary registers, back-order registers, a cash receipts journal, customer statements, aged accounts receivable reports and trial balances, he noted.

The same common data base that facilitiates the order entry and accounts receivable processes also makes possible detailed and definitive inventory control and sales analysis for PSI. All information in the inventory file is accessible for inquiry purposes or four reports and covers not only quantity on hand, but also quantity on order, quantity committed and available, he said.

Sales analysis is by item, salesman and customer and provides cumulative totals, profit percentage figures and commission percentages with a variety of periodic comparisons. Unit entry caused some initial problems with both files, but the problems were addressed and resolved.

The payables and general ledger features of 'Solution' were the last to be installed.

Information Gathering Important in Judging Turnkey Vendors

By Leonard Farano

Special to Computerworld

How does the end user go about selecting a turnkey vendor? A first-time user will probably be introduced to a turnkey systems vendor by the minicomputer manufacturer he has called for information.

In addition, some of the larger, more successful application software firms are beginning to advertise turnkey services in data processing magazines and newspapers.

Let us assume the equipment being offered is manufactured by a viable, reputable mini manufacturer who can and will provide a separate service maintenance agreement. Let us further assume the equipment proposed appears sufficient to satisfy the end user's capacity needs.

The following additional information must be gathered to properly evaluate the turnkey systems vendor:

- Has he responded professionally to the user's specification bid?
- Does he have both the technical expertise and the application experience to deliver a quality product?
- Is he financially stable?
- Can he demonstrate successful installations of similar applications on similar equipment?
- Does he have a good track record for delivering systems on time for the original price quoted?
- Does he have specific industry knowledge?
- Will he take delivery of the equipment for testing and only redeliver to the end user when he has deomonstrated that the system works to the user's satisfaction?
- What is his software maintenance policy?
- Is he capable of installing systems at remote locations, i.e., in a distributed network?
- Does he use standard operating systems and languages?
- Will he assist in the conversion and training effort?
- Can the user interview and approve the specific individuals who will be assigned to develop his system?
- Does he have sufficient personnel available to handle the user's requirements?

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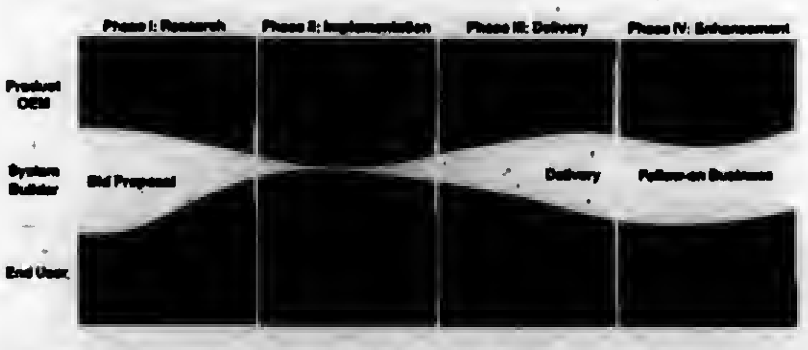

Interdata's computer products and services exist for one reason – to satisfy our customers: The Product OEM, the System Builder and the End User. Each of these computer buyers has a Computer Life Cycle with four specific Phases – Research, Implementation, Delivery and Enhancement. Interdata responds to customer needs during each Phase with Computer Life Support.

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If you are looking for a company where your ideas will be listened to and where your achievements will be recognized and rewarded, we'd like you to consider the following opportunities.

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Communications and Networks

The Communications and Networks Group has the charter for the design, development, and enhancement of all DECNET and related communications software and microprogramming.

In these positions you will be responsible for the design and implementation of front-end and test of communication software relating to operating systems, remote work entry stations, terminal concentrators, foreign machine interfaces, network protocols, and block mode terminal software.

We require 2-7 years experience in software design with an emphasis on communications protocols, front-ends, networks, and communication emulators. Experience with PDP-11 assembly language and a degree or its equivalent in Computer Science or Electronics Engineering is desirable.

Research And Advanced Development

In this highly visible and dynamic organization you will be a member of a research team whose function is to investigate future technologies, design and implement prototype systems, and to provide consulting services to engineering development groups.

We require exceptional qualifications in terms of both theoretical and practical aspects of systems development.

Ideal candidates would have a PhD or equivalent in Computer Science and have demonstrated significant research activity in any of the following areas: Operating Systems, Software Reliability, Networks, Microcomputer/Multi-Processing, Software Advanced Development, or Automated Applications Programming.

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If you are tired of bit pushing in assembly code; and languages like ALGOL, BCPL, PL/1 or BLISS are part of your vocabulary, then you are the kind of person we are seeking to join a growing development team producing new and expanded BLISS implementation language processors and support tools.

We are looking for people at all levels of experience who will contribute at all phases from language design through integrated testing. A BS or MS or equivalent in Computer Science with special interest in language design and compiler development is desirable.

Software Engineering

Digital is seeking highly motivated software developers who have 3-10 years of systems oriented software experience. Applicants must possess a high level perspective on the state-of-the-art of software methodology and must demonstrate the ability to work creatively with both top level management and technical engineers. Successful candidates must be able to personally design and implement software for PDP-11 systems.

Openings now exist in the Software Quality Management organization for developers who will implement software tools and technology that will aid us in producing the best software products in the industry.

If you have the technical experience on systems software and are looking for a rewarding future with one of the fastest growing companies in the industry, please get in touch.

Software Development

Industrial Automation

This is a unique opportunity for software professionals with experience or an interest in industrial automation to assume highly challenging and rewarding positions with our Industrial Products Group. Ideally, you will have minicomputer operating systems or applications experience in the field of industrial automation or you will have a strong software development background and an interest in applying your expertise to industrial automation.

This is a growth opportunity offering involvement with both minicomputers and microprocessors, and an excellent opportunity to learn and develop programs in higher level languages as well as microprocessors. Contribute within an environment where the problems associated with developing software are appreciated and every attempt is made to establish a planned and organized approach. If you are ready for this challenge, we would like to talk to you.

Project Management

You should have a BS degree and at least 7 years experience in Real-Time application systems development.

Previous management or supervisory experience in developing customer software/hardware minicomputer systems as well as good customer interface and interpersonal communication skills required.

You must be familiar with Real-Time Operating System concepts including related applications experience in areas such as factory data collection, materials handling, process monitoring and control, communications, inventory control, and data base management.

This position is available in CSS (Computer Special Systems) and will be temporarily located in Maynard until Nashua is open in late summer or early fall.

Applications Programming

We have openings for programmers with a BS degree and 3-5 years experience in assembly language and FORTRAN applications in a Real-Time environment.

You'll need PDP-11 assembly language, familiarity with Real-Time Operating Systems concepts, as well as familiarity with RSX-11M, RSC-11D operating systems.

You should also have experience working on a programming team, developing applications systems in areas such as manufacturing, power systems, materials handling, machine control, data acquisition, process monitoring and control.

This position is available in CSS (Computer Special Systems) and will be temporarily located in Maynard until Nashua is open in late summer or early fall.

NCC Interviews

Please phone Justin Kelleher at (212) 758-2600 to arrange an appointment to discuss the following positions: Software Engineering Communications and Networks, Research and Advanced Development, Systems Implementation Language Development and Software Engineering.

Please phone Art McMahon at (212) 758-2600 to arrange an appointment to discuss the following positions: Software Development Industrial Automation, Application Programming and Project Management.

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Firm Goes to Mini to Handle 25% Increase in Volume

NEW YORK – Installing a turnkey minicomputer allowed a property management agent here to increase its volume 25% without hiring additional personnel.

Adding the two new large accounts might have been impossible without a computer, regardless of the personnel factor, according to Howard M. Sonn, president of Sonn-Saalberg Co., Inc.

"Quick information is a prime factor in giving a client proper service," Sonn said.

Owners of residential properties are hard-pressed to withstand rises in taxes, fuel, equipment, wages and other costs, he said. Securing optimum results via the prompt processing of bills, follow-up of arrears, preventive maintenance, etc. is essential, he said.

The firm has more than 6,000 apartment units under management in 152 properties owned by 86 clients in the metropolitan New York City area. A typical building is a six-story elevator apartment house with 60 families, with a range that extends from three families over a store to a 600-unit development of five 15-story buildings on seven acres.

Such a client roster generates a vast amount of paperwork that is expensive to process and highly resistant to analysis. Just getting out the rent bills and monitoring collections are major operations in themselves. So Sonn-Saalberg decided it had to upgrade its essentially manual data processing mechanism.

The major options considered were time-sharing, service bureau or an in-house system. The firm opted for the last, on the premise that it would be the most cost-effective way to keep abreast of its requirements.

Turnkey System

The company selected a VMAC/11 system from Columbus Computing Corp. of New York. Employing a Micos operating system and hardware by Mini-Computer Systems in Elmsford, N.Y., Columbus supplied a turnkey system for realty property management.

The most significant result since the system went into full operation in January has been "achievement of a highly cost-effective means of servicing our accounts," Sonn said. Data processing costs are less than 35 cents per month per tenant unit, he added.

The basic configuration is a Data General Corp. Nova 2/10 CPU, Diablo 44 disk drive, Centronics Data Computer Corp. printer and two Hazeltine Corp. video display terminals. The Sonn-Saalberg system has five terminals on-line.

Current personnel were trained as operators and no technicians were hired for daily operating purposes, he added.

Six basic modules make up the system: tenant billing, accounts receivable, accounts payable, payroll (both Sonn-Saalberg and landlord personnel), management reporting and video inquiry and owner-reporting subsystems. The basic package provides about 20 reports regularly, with 20 more generated on demand, he said.

Among the reports are: statement of collections, statement of disbursements, arrears report, rent roll listing, collection performance and commission reporting.

The maximum base-rent report controls rent increases in New York City rent-controlled buildings and is also on-line. Before computerizing, Sonn-Saalberg could review just one building a day. Now it handles all properties under its management in one hour, greatly facilitating owners' ability to ask for more rent, Sonn said.

With all files updated upon receipt, the video inquiry feature has been very productive, Sonn said. "Since data is put in and taken out simply and rapidly, with our operators able to read it from the screen, we are secure that the landlord – or the tenant, for that matter – can ask any reasonable question about his account and get the right answer right away. In this business, that is a substantial achievement."

Single-Board Memory Contains 256K Bytes

CRANBURY, N.J. – Dataram Corp. has introduced its DR-128 single-board 256K-byte core memory system. Containing 2.4M bits, the DR-128 is the "industry's largest capacity single-board core memory system," the firm claimed.

While providing speeds in the main memory range, its capacity makes it suitable for high-performance peripheral applications, the firm said.

The DR-128 can be addressed as either 256K by 9 bits or 118K by 18 bits. Up to eight DR-128 systems or 2M bytes of storage can be contained in one chassis, Dataram noted. Cycle time is 1.3 µsec and access time is 650 nsec, the firm said.

The DR-128 costs $6,500 in single quantity and $4,750 in 100-unit lots. Dataram is located at Princeton-Heightstown Road, Cranbury, N.J. 08512.

Automatic Loader Released For Floppy Disk Testers

PHOENIX – Three Phoenix Co. has introduced an automatic loader for floppy disk testers, the firm said.

The Floppy Disc Auto Loader was designed for a Memorex 652 disk drive, but can be adapted to most floppy disk drives, a spokesman said.

The loader can handle up to 20 disks at a time, eliminating the insertion and removing by hand for each disk tested. When used on the Three Phoenix tester Model FD-33, 50 disks can be tested in about an hour, including six seconds required for loading and unloading, he said.

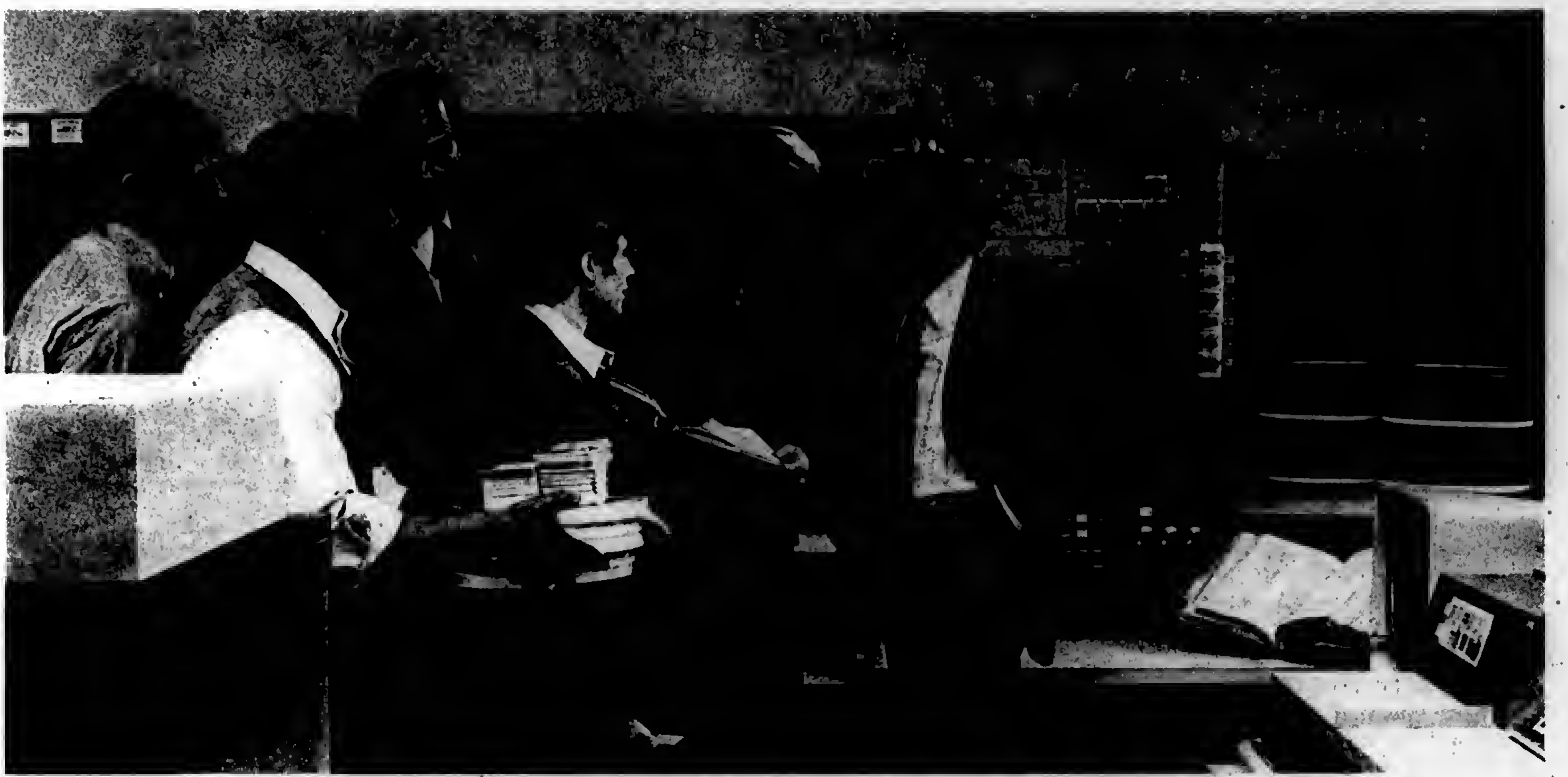
A dual stacking mechanism offsets rejected disks 1/2 in. from good disks, allowing easy separation after testing is completed, he added.

A two-pocket stacker that physically separates good and bad disks is also available, he said.

The Floppy Disc Auto Loader costs $3,250. Three Phoenix is at 10632 N. 21st Ave., Phoenix, ARiz. 85029.

Model
204
Database Management
Software System

"Overall, we found Model 204 to be one of the most capable data base management systems we've ever analyzed, and certainly one worthy of the consideration of anyone shopping for a DBMS for his OS or OS/VS IBM System/360 or 370 installation."



Your mother needs help.

At one time, people were willing to wait around for your big computer to get around to them.

No more.

Now they're demanding more work, faster than your mother can possibly do it.

Which has put you in a rather difficult position. You've either had to put them off, or put your mother through an upgrade so expensive it's unreal.

Neither of which you have to do any more. Because now you can get your mother a little help. A computer that can do the jobs she's too busy to do.

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The C/300 is smaller than the big computers you may be used to using. But it has the things big computers have. A comprehensive commercial instruction set that even has an EDIT function, for example. And large memory configurations.

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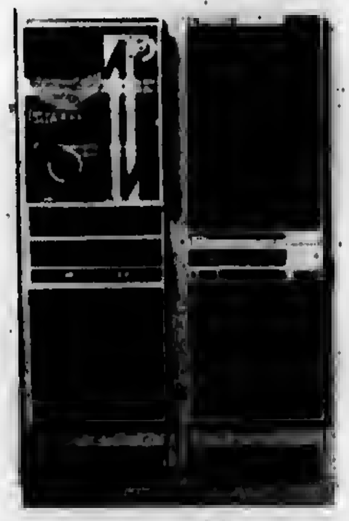

And the C/300 has intercomputer communications ability that lets you interface to your mother. Directly via channel connect, or via communication lines so it can emulate 2780's or HASP. Or be itself. And, wherever you put an ECLIPSE C/300 you can hang terminals off it with synchronous or asynchronous lines.

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Real-Time Machine Gives Weathermen Clearer View

VANCOUVER, B.C. – A real-time minicomputer has helped meteorolgists at the Pacific Weather Center (PWC) here improve the accuracy of their forecasts, the user said.

PWC provides public, marine and aviation forecasts in this Canadian province, where climactic zones range from almost desert-like interiors to coastal areas with more than 300 inches of precipitation a year.

The user installed a 32K Hewlett-Packard 2100S mini with Real Time Executive 1 (RTE/I) software in October 1973. Last year PWC decided to accelerate forecasting procedures by replacing its Teletype 33ASR terminals with interactive display terminals to handle the fast changes in weather conditions.

Previously the forecaster would gather the line-printed data, make an analysis and then type up the forecast. It was then sent to an operator who retyped it on a Teletype with the appropriate codes.

It was retyped a second time on paper tape to prepare it for transmission.

Now the meteorologist edits the forecast on the CRT screen and the result is punched out on paper tape. The tape is then fed into the mini, a spokesman said.

"Eventually, we will be able to eliminate the paper tape and block transfer the completed, edited forecast to the CPU for transmission," he continued.

Forecasters can also summon observations by station area, trend and circuit sequence and, if desired, can highlight specific meteorological conditions. A display enhancement function points up adverse weather conditions such as rain, snow or fog.

Memory Most Important

But the most important feature in terms of expanding the capacity of the system, PWC engineers said, is the CRT's memory.

With an internal memory capacity of up to 8K, the user can gather and store all the data needed in the terminal.

The system designers also replaced RTE 1 software with the RTE II, which allows the CPU to accommodate several terminals simultaneously, the spokesman said.

The plotting of surface maps is a regular PWC routine done four times each day. Synoptic reports are plotted on a chart every six hours, a job that previously required two man-hours to complete.

Using the mini-driven printer/plotter, the task can now be accomplished in 9- to 10 min, according to the spokesman.

PWC meteorologists first recognized the need for computerization in 1969 and subscribed to a time-sharing service. But, with only two to three hours of terminal time, use of the computer focused primarily on research development; forecasting remained a time-consuming manual procedure.

Eventually the need for high-speed data collection, data manipulation and computed forecast parameters led PWC to investigate the use of a real-time minicomputer.

"The time-sharing budget was going up rapidly – topping $40,000 a year," the spokesman said. "One of our ongoing routines, like the probability of precipitation, might have cost $4, but at four times a day, 365 days a year, that's pretty expensive.

"Now multiply that by 25 to 30 routines and you can understand the problem," he added.

In addition to the mounting costs, the time-sharing service, although an improvement, did not solve PWC's paper problems, he said. Three Teletypes and a Telex circuit maintained a constant flow of reports from an observation network – reports that had to be stored, filed and analyzed before reaching the computer.

"Now we use the mini like others use a medium to large computer," the spokesman said.

Xebec Has Formatter Storing 1.2G Bytes

SANTA CLARA, Calif. – The Model XDF-76 disk formatter from Xebec Systems, Inc. operates with IBM 3340-type disk storage modules and provides 40M- to 1.2G bytes of storage capacity, the firm said.

The formatter features error-correction codes, rotational position sensing and interleaving for consecutive sector transfers, a spokesman added.

Additional features include 128K-byte transfer in one operation, overlapped seek of up to four drives simultaneously, 512-byte buffer for computer/drive synchronization and multiport capability, Xebec said.

A typical storage module system with a 100M-byte capacity costs $13,200 while a 300M-byte system costs $24,000, the firm said from 2985 Kifer Road, Santa Clara, Calif. 95051.

VMF Uses Micro to Control Tape I/O Storage System

BAYSHORE, N.Y. – VMF Industries, Inc. has introduced what it said is a "totally flexible" microprocessor-controlled RS-232 tape I/O storage system.

The VMF system utilizes a 3M Co. data cartridge, variable size random-access memory buffers and a single or dual cartridge control system with an Intellec 4040 microprocessor.

Teletypewriter, RS-232 and other communications formats are available, with switch-selectable speeds from 110- to 9,600 bit/sec, the company said.

The system is priced at about $5,000 and includes a 4-track, read-after-write system with 48K-byte transfer rate and over 5M bits of unformatted storage, VMF said from 216 N. Fehr Way, Bayshore, N.Y. 11706.

WE Has PDP-8 Memory Semi

HOUSTON – WE Computer Extension Systems has a semiconductor memory system that plugs up to 8K of memory directly into one slot of the Digital Equipment Corp. PDP-8 Omnibus chassis, the firm said.

The system is available in two models, 8K 12-bit words and 4K 12-bit words.

A field select jumper matrix allows memory field assignment in 4K increments, a spokesman said.

The 4K version costs $400 and the 8K version costs $650 from the company at Suite 176, 17311 El Camino Real, Houston, Texas 77058.

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Used for Accounting

Service Finds Portable Unit 'Best Deal'

STERLING HEIGHTS, Mich. – A travel service here is using a portable desk-top system for its general accounting functions.

Travelcraft, Inc. considered Nixdorf and Burroughs systems before settling on an IBM 5100. "It was the best deal for the money," according to Gerald Choma, owner of the firm.

"In just a few months, our savings in cash flow alone have more than justified the addition of the computer in our business," he added.

Travelcraft bought a 32K machine with a printer and auxiliary tape unit for about $18,000, he said.

"With the increase in leisure time and more affordable tours, we're seeing a significant increase in travel.

"That's the good news.

"The bad news is that the resulting accounting involved – particularly for commercial accounts – virtually dictates the automation of accounting and billing activity," he said.

"The tickets we draw from air carriers must be paid for every seven days. From a business cycle standpoint, that makes cash flow critical," Choma said.

Travelcraft switched from an accounting service to its own system because "the software was on a 30-day cycle and was too much outside of my control," he said.

"Even though I had absolutely no experience with computers previously, I now have 26 different computer programs running that I wrote for my business," he noted.

Choma currently does all of his own accounting for all sales, which include cash, credit card and commercial accounts. He now also has complete asset controls, bank balance records and check journal accounting operational.

In addition, the employee payroll and required supporting records are now on the system.

"To illustrate the kind of speed we now have possible," he said, "we recently had a commercial billing paid for in just two days. There was absolutely no way we could do that before.

"What I've accomplished can easily be justified in a $1 million travel agency.

"We're in a business where we're responsible for a lot of money that isn't ours," he said. "With the portable computer, we've been able to better manage our business and our all-important cash flow."

Travelcraft acts basically as an escrow agent for a multitude of carriers and travel-related businesses. But, he added, it's important to have the employees selling and the computer doing the required accounting work.

In the future, Choma anticipates using the system for inventory control of reserved hotel rooms and airline seats.

Infotek Memory Ups HP 9830A to 32K

COVINA, Calif. – The EM-30 extended memory system from Infotek Systems extends the total read/write memory capacity of the Hewlett-Packard Co. (HP) 9830A Basic programmable calculator to 32K bytes, the firm said.

The EM-30 is compatible with all Basic software and HP read-only memory options and uses 4K random-access memory chips, the firm said.

The memory is said to be a direct plug-in replacement for the standard HP memory and costs $5,320 from the firm at 733 E. Edna Place, Covina, Calif. 91723.

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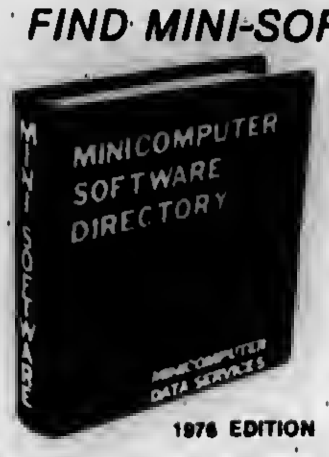

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Unit Requires +5V, +12V Power Supply

ENGLEWOOD, Colo. – The 8080+ Development Station from Monolithic Systems Corp. is a fully assembled microcomputer that requires only a +5V and +12V power supply to be fully operational, the firm said.

It includes Monolithic's 8080+ microcomputer with control panel and wire-wrap section, 16K dynamic random access memory (RAM), 512 words of erasable programmable read only memory (Eprom) and an operating system loaded in 4K of writable read-only memory (ROM), the firm said. The operating system includes resident assembler, editor, and teletype software/hardware interface, it noted.

A basic development station costs $1,976. Monolithic is located at 14 Inverness Drive East, Englewood, Colo. 80110.

SMS Enhances Device

CORNING, N.Y. – Scientific Micro Systems (SMS) has improved the processing speed of its bipolar microprocessor and has introduced two new I/O interface components.

The SMS 300 CPU now provides minimum system cycle time of 250 nsec compared with a 300-nsec cycle time previously.

The faster cycle time permits direct control of double-density floppy disks, SMS said.

The two I/O units are the SMS 362 and SMS 363 interface vector (IV) bytes. Both feature external clocking and input latches which operate asynchronously with CPU timing.

In quantities of 100, the components cost $90 and $8 each for the CPU and the IV bytes, respectively.

Scientific Micro Systems, Inc. is at 520 Clyde Ave., Mountain View, Calif. 94043.

PCS Announces 180 Family Built For Industrial Environments

FLINT, Mich. – The PCS 180 family from Process Computer Systems (PCS) are industrial microcomputers that work in dirty, corrosive environments, the firm said.

The 180 systems "use tristate bus logic to ensure that both high- and low-speed peripherals can be interfaced with a high degree of bus efficiency," the firm said.

The 180 series is expandable: if a process is changed, building blocks can be changed or added without rewiring or prolonged shutdown of equipment, it noted.

The top of the PCS line is the Superpac 180 which provides both full Ascii keyboard and CRT display capability in a single package. The system includes the PCS 1806 microcomputer, the firm said, and costs under $1,000 in 50-unit quantities.

PCS 180 Microcomputer Family

The Micropac 180 is a rack-mountable industrial microcomputer system priced at $695 in quantities of 50. The system includes the PCS 1806 as well as a four-slot chassis, power supply and industrial front panel with on/off switch and status indicators, the firm said.

Micro Products

The single-board PCS 1810 includes power fail/auto restart and battery back-up to support its 256 bytes of memory for up to 10 days, the firm noted.

Users can build onto this basic system by adding memory, I/O and peripheral and communications options, PCS said. The 1810 costs $300 in quantities of 50.

For applications where battery backup is not important and where more memory is required on a single board, PCS offers the 1806. The 1806 comes with 1K byte of Random Access Memory and provisions for 7K of erasable read-only memory or read-only memory. The unit costs $256 in quantities of 50, it said from 5467 Hill 23 Drive, Flint, Mich. 48507.

MC80 Controller Available From GNAT

SAN DIEGO, Calif. – The MC80 micro controller from GNAT Computers is a mini system CPU for dedicated applications use such as process control, instrumentation and communications systems, the vendor said.

Using an Intel 8080-type microprocessor, the system is contained on a single card and features 256 words of read/write static random-access memory, expandable to 512 words, and up to 2K of custom application programmable read-only memory storage.

The structure and compatibility of the MC80 is such that is allows full usage of I/O peripherals, the firm said.

The MC80 costs $189 from the firm at 8869-C Balboa Ave., San Diego, Calif. 92123.

Dynage Introduces Power For Micro-Based Systems

BLOOMFIELD, Conn. – A power supply designed for microprocessor-based systems is available from Dynage, Inc.

The Model 3MA-MP provides power for the CPU module plus peripheral modules, including memories in systems applications, Dynage said.

Three outputs are furnished. All are provided with independent overvoltage protection and are temperature compensated and adjustable, the firm said.

The Model 3MA-MP costs $175 from the vendor at 1331 Blue Hills Ave., Bloomfield, Conn. 06002.

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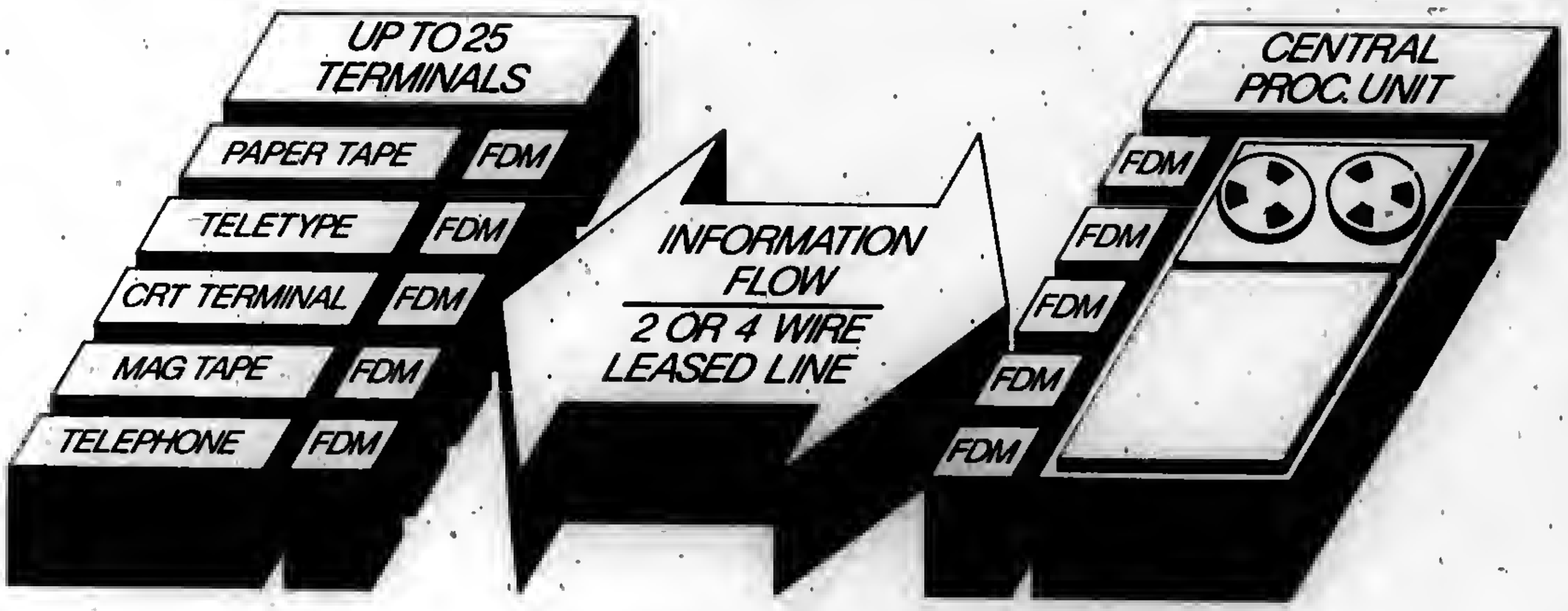

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Improvements in Minis' Magnetic Media Seen Coming Through Error Correction

NEWPORT BEACH, Calif. – Magnetic media and devices for data storage have reached an engineering plateau, and improvements for the near future will result from more effective testing and built-in error-correction techniques, an audience of computer professionals was told here recently.

Speaking specifically of demand for greater density of stored data and higher read/write speeds, Michael S. Shebanow, vice-president of engineering for Pertec Corp.'s Peripheral Equipment Division, said he foresees no major technological advances making a significant impact in the near future.

"The more stringent demands of new minicomputer systems will be met by more reliable production testing on the part of manufacturers and through the implementation of error-detection and correction methods that are now chiefly limited to big data system files," Shebanow said.

An example of the error correction technique is a read head offsetting feature on some systems, he said. The read head searches from edge to edge of a track location if no signal is found where one is expected.

Other error-correction techniques Shebanow expects to be available for low-cost minicomputer systems are variations of techniques now limited to large systems, such as track or sector reassignment.

Large system controllers using hardware and software methods can automatically define the locations of defects on a disk and then format information for storage so these areas are not used, he said.

Still another approach is to employ special algorithms based on, for example, the "fire codes" which were used in the IBM 3330 drive. In this system the data can be reconstructed even if a number of bits are missing in a record, Shebanow noted.

These improvements are coming into demand because minicomputer system manufacturers want to store more and more data without increasing storage cost per bit, Shebanow said.

As density increases and pulse transition for reading and writing is done faster, defects in the media become more critical.

Production testing of some manufacturers is providng inadequate for disks that are used to the limit in minicomputer systems, he said.

"It has long been considered adequate to test an unmounted 200 step/disk at 400 step/in. The overlap provided by this method was considered sufficient to surmise whether a bit could be lost," Shebanow siad.

"Recent studies, however, have shown that the single-disk, double-track test does not ensure a very high level of reliability for worst-case applications of advanced minicomputer systems.

"We have reached the point where thoroughly reliable testing must be done under actual conditions," Shebanow concluded.

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Compunetics Has Mini With Micro

CHICAGO – A turnkey microprocessor-based minicomputer from Compunetics, Inc. was designed for small- and medium-scale organizations, the vendor said.

The system can accommodate multiple controllers with up to eight CRTs, four floppy disks and four hard disks per controller, a spokesman said.

A typical system selling for $12,000 includes the firm's CPU, one 1,920-character CRT, two 315K-character floppy disks, a 65 line/min printer and software, Compunetics said from 327 South La Salle St., Chicago, Ill. 60604.

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CI Notes

Bills in House, Senate Reduce 'Disc' Incentives

WASHINGTON, D.C. – Tax bills approved by both the House Appropriations Committee and the Senate Finance Committee will reduce but not end tax incentives offered firms that export U.S.-manufactured goods through domestic international sales corporations (Disc).

Under the current Disc program, American firms are permitted to set up separate subsidiaries to handle U.S.-manufactured exports; one-half of the income earned from these overseas sales can be deferred indefinitely.

The House bill would permit companies to defer taxes only on about 25% of such earnings, using a formula that involves averaging earnings over a moving base period.

Thus the first 75% of Disc income would be taxable and payable at once at the same rate as a firm's domestic earnings.

The Senate bill sets a floor of 60% and a somewhat different base period.

The House bill eliminates Disc benefits for military goods. The Senate bill retains Disc eligibility for military goods that compete with foreign-made products.

The House bill would cut the tax break received through Discs by $550 million annually; the Senate bill would reduce that tax break by about $460 milion.

X3A1 Seeks Data on Matrix Printers

KEENE, N.H. – The American National Standards Institute (Ansi) X3A1 ad hoc committee on dot matrix printing is studying OCR-A and OCR-B characters as currently being printed using dot matrix techniques.

Manufacturers who believe they are capable of printing these characters using a dot matrix technique are asked to contact chairman Bruce Norlund at 150 Congress St., Keene, N.H. 03431.

Supershorts

General Computer/Systems, Inc.'s new Australian distributor is Datronics C.M.A., which replaced Datanamics in that capacity.

– – –

Centronics Data Computer Corp. has named UTE Engineering and Trade Co. as a nonexclusive distributor in Turkey.

– – –

Data Dimensions, Inc. has agreed to market Diablo Systems, Inc.'s Hyterm terminal.

– – –

Ontel Corp. has selected Interscan Data Systems, (U.K.) Ltd. to market, service and develop European applications for Ontel terminals.

Welke on Software Bundling:

Support, Not Price, Paramount Criterion

By Edith Holmes
Of the CW Staff

NEW YORK – Price is not the important factor when computer users decide to buy software, according to Larry Welke, presdient of International Computer Programs, Inc. (ICP).

Both the price of a software product and the decision to buy it hinge, instead, on users' willingness to pay for services, he said here recently.

Appearing as a witness on behalf of the U.S. government in its antitrust suit against IBM, Welke told the court users will continue to pay higher prices willingly – as they did in the 1960s when systems prices were bundled – whenever the additional money assures them of support, maintenance and education from the vendor.

The advantages mainframe makers found in bundling their hardware and services into one price prior to IBM's unbundling in 1969 are the same advantages independent software suppliers find by including support with their software products today, he suggested.

Welke said he once believed unbundling would benefit users by giving them a wider range of alternative products and vendors.

After hearing users complain about separate prices for equipment and services in the wake of IBM's move to unbundle and watching only the more cost-conscious among them take advantage of the freedom to pick and choose in the marketplace, however, he said he now maintains unbundling only benefits "commercially mature" marketplaces.

Bundling "is advantageous in a young industry," he said. It was important to the development of the computer industry from the 1950s through the 1960s and it's important to the development of the software industry now, he added.

In the commercially immature industry, bundled prices give users two different advantages, Welke said.

First, with one price to contend with, users have a predictable cost against which they can budget. The more sophisticated users will find a way of breaking out costs and controlling them; for many others, however, computing has sufficient elements to make this task appear too difficult, he said.

In addition to finding one dollar amount easier to deal with, Welke said users gain an insurance policy against unknown problems by relying on the vendor.

A single price provides a single source to go to with the assurance that whatever problems have been encountered will be solved, he said.

Before IBM and other computer system manufacturers unbundled software and services, users felt "education, mainte-

(Continued on Page 86)

IBM No. 7 Among Fortune 500; List Includes 22 Industry Firms

By a CW Staff Writer

NEW YORK – In 1975, a year in which a bearish market of two years' standing gave way to a bullish one, 22 computer manufacturers were represented in *Fortune* magazine's listing of the 500 largest U.S. industrial corporations.

While Exxon and General Motors retained their number 1 and 2 positions respectively in the 500 listing, IBM increased its sales by nearly 14%, moving that corporation up two places into seventh, ahead of General Electric and Gulf Oil.

But in terms of assets and net income, IBM ranked fourth and second respectively.

In other impressive gains in the listing, three newcomers to the 500 made a showing. Ball Corp. rose 93 points to rank 429 in sales, Foxboro Co. rose 73 to 490 and Tektronix rose 62 to 457 while Perkin-Elmer Corp. returned to the 500 with a gain of 18 to 498.

IBM on Top for Sales

Ranked by sales, IBM led the computer industry representatives on the *Fortune* list, followed by Xerox in 39th place and Greyhound in 41st.

Sperry Rand rose nine places from 69 in 1974 to 60 this year, while Honeywell stood solid at 67. Despite an eight-notch drop, Singer ranked 73; in terms of net income, however, it ranked 493.

NCR was number 96 in sales, Burroughs rose 10 places to 124 and Texas Instruments ended up at 152.

Control Data Corp. rose 17 to 170; Hewlett-Packard gained 19 slots to 207; Digital Equipment Corp. jumped 63 places to 326 and Pitney-Bowes was at 369.

Tektronix ranked 457 in terms of sales but an impressive 280 in net income.

Varian was number 485; Nashua dropped 26 places to 491.

Bunker Ramo, listed as 467th in 1974, failed to make the 500 listing this year.

DEC Highest in Returns

With an industry median of 64.38% for total return to investors, which combines dividend yield and price appreciation, DEC ranked among the 10 highest in the total 500 listing, with a return of 169.7%. Nashua, on the other hand, led the low returns with -34.41% and ranked 477 in this area.

Among other industry representatives, IBM showed a return of 37.35%, for

(Continued on Page 86)

Independents Seen Unaffected By IBM Cuts in Memory Prices

By Molly Upton
Of the CW Staff.

The recent IBM price reductions on MOS memory [CW, May 24] may well affect the independents' pricing on their 512K-byte memories, but otherwise the independents' pricing is expected to remain unchanged, according to Dick Bravo, general manager of systems equipment operations at Electronic Memories & Magnetics Corp.'s (EMM) Computer Products Division.

And IBM's announcement that it has increased the memory on its 370/115-2 and 370/125-2 (see story on Page 57) could create a market opportunity for the independents, he observed, noting EMM previously had not offered products for these machines since the expansion capabilities were so limited.

Bravo said he did not know of any independents currently wooing the 115 and 125 markets, but said he expects to see some considering this step.

Richard J. Egan, assistant general manager of Intel Corp.'s Memory Systems Division, said that firm is waiting to see users' reactions. It is also wondering what IBM's next step will be, he said.

Comparison of CPU prices and memories indicates IBM reduced the price of 512K MOS memory by 35.5% form $131,500 to $85,000, Bravo said. All other price reductions are based on this cut, although for various reasons the percentage of price reductions on CPUs and memories are not across the board.

In the larger memory sizes, the percentage and dollar drop are substantial,

(Continued on Page 88)

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IBM 360 Proved Nutrient for Software Market: Welke

By Edith Holmes
Of the CW Staff

NEW YORK – Before there could be software products and a software industry, there had to be a market for them, the president of International Computer Programs, Inc. (ICP) told the court hearing the U.S. vs. IBM antitrust case here recently.

Larry Welke said the concept of "software product" was not really feasible in the 1964-65 time period because a wide audience of users of compatible equipment had not yet been established.

The middle 1960s marked a transition period as users of IBM's 1400 equipment moved to models of the 360 series, and the creation of a large, homogeneous audience or marketplace for software products was under way, Welke said.

By 1968, wide user acceptance of 360 equipment gave life to the idea of software products, he stated.

It took until 1968 for 360 users to see their systems "settle down." By that year, 80% of the original 1964-65 systems had done so, although a few users didn't fully accept their 360 systems until as late as 1971-72, he added.

With wide acceptance of the IBM machines, independent software suppliers could design a program for the 360/30 and be assured it could be used on the entire 360 line, Welke said. Any user of the 360/30 and larger models could be a prospective customer for the software product.

In addition, the software seller could assure his buyer that the product was compatible with the larger 360s.

Fractured Market

For the first time, Welke said, software vendors had a large, potential market for their products. Before the 360 and its wide acceptance, the limited transferability of programs for other manufacturers' machines tended to fracture the market.

Software vendors spent their energies producing several different versions of the same solution to one problem, he said.

Maintaining that "the economics of profit depend on multiple copies of one design," Welke stated this fracturing of the market and of the efforts of independent software suppliers retarded the feasibility of the software products concept.

The notions of software products and of buying software also gained user acceptance as the complexity of equipment and programming increased, causing in-house programming costs to go up, he noted.

Welke, testified during his first stint in court as a government witness over a month ago that IBM's 1969 move to unbundle its software and services from its hardware and price these elements separately further encouraged users "to consider software a product" [CW, May 3].

Support Paramount in Software

(Continued from Page 85)

nance and support services were theirs for the asking – and for the price of renting the hardware.. They knew they would have a system that operated to satisfy their DP needs," he added.

The ICP president indicated it is this user reliance on services and support that makes software products "relatively price-insensitive, except where there is competition in that product's application area."

Welke stated he believes the software vendors will eventually follow in the footsteps of the systems manufacturers and price the elements making up their software products separately..

The process will, however, be an evolutionary one, he said, and it will depend on users becoming sufficiently mature to look at all elements of DP from a costs and an alternatives point of view.

IBM Ranked Seventh In Fortune 500 List

(Continued from Page 85)

306th place; Sperry Rand 46.18%, Honeywell 65.63% and Singer -14.78%.

Newcomer Tektronix showed a return of 131.27% and Ball 71.38%.

Office equipment manufacturers, including computer manufacturers, had an industry median of 11.7% return on stockholders' equity.

Singer, which ranked 73rd in sales, was the year's leading money loser. with a loss estimated at $451.9 million.

Despite a poor overall sales record for the 500, two-thirds of the companies reported higher sales, including all but five industry groups. Office equipment, including computers, rose 11.1% for 1975, ranking seventh of 28 industry groups.

As a whole, sales for the 500 rose to $865 billion, an increase of only 3.9% over 1974, according to *Fortune*. In real terms, however, sales of the 500 actually declined in 1975 since the U.S. government's index of the price of manufactured goods rose by 11%, the article stated.

Expansions

Centronics Data Computer Corp. has expanded its West German subsidiary, **Centronics Data Computer GmbH**, into larger quarters at the same location.

Digital Equipment Corp. will begin work this spring on a 275,000 sq-ft building in Salem, N.H., to expand final assembly and test capabilities centered in Westminster, Mass. It will also purchase a 100,000 sq-ft building in Maynard, Mass., for field service operations and plans to double the size of its 70,000 sq-ft Canadian headquarters in Kanata, Ontario.

IBM is building a 10-story office building in the Allegheny Center in Pittsburgh, Pa.

Prime Computer, Inc. plans a 70,000 sq-ft addition for its present headquarters building in Framingham, Mass.

Peripheral Dynamics, Inc., a manufacturer of card readers and other computer peripheral devices, will relocate its manufacturing and marketing operation to a new plant in Norristown, Pa.

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Commerce, Cocom Ease Controls On DP Exports to Communists

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – The U.S. Commerce Department and the Free World Coordinating Committee (Cocom) have eased some of their export restrictions on computer systems sold to Communist Bloc nations to help standardize conditions under which exports can be approved.

The changes should not be interpreted as a signal that controls on DP equipment will be reduced overall, according to John Collins, who heads the Export Control Administration's Computer Division.

A two-tiered set of guidelines was issued. Equipment with performance specifications no greater than those cited on List A may be exported with approval from the Commerce Department alone. Higher performance equipment, included in List B, requires approval from the Commerce Department, the Defense Department and in some cases other agencies, but is expected to get "favorable consideration," according to industry sources.

On-site inspection requirements were included with the new export terms, according to the Commerce Department's letter to nine manufacturers.

Those that received the letter were NCR, Data General, Digital Equipment Corp., Honeywell Information Systems, Hewlett-Packard, Varian Data Systems, Control Data Corp., Univac and IBM, Collins said.

List A Specifications

Only Commerce Department approval will be needed to export equipment with performance specifications that do not exceed the following:

- CPU process data rate of 13M bit/sec where floating-point operation is implemented by hardware or firmware.
- Internal memory speed of 4.72M bits.
- Effective bit transfer rate for peripheral memory of 1.6M bit/sec.
- Disk memory capacity of 1.9G bits.
- Disk memory performance factor (net capacity in million bits divided by the average access time raised 3/2 power) – 64,000.
- The sum of the I/O bus rate or the total effective bit transfer rate, whichever is less, and CPU rate of 60M bit/sec.

List B Specifications

Equipment that needs Pentagon approval and in some cases approval from other agencies includes those with:

- CPU process data rate up to 32M bit/sec.
- Internal memory up to 6.3M bits.
- Effective bit transfer rate for peripheral memory or data channel of 3.4M bit/sec.
- Disk storage of 3.2G bits.
- Disk performance factor of 135,000.
- The sum of I/O bus rate, or total effective bit transfer rate, whichever is less, plus the CPU bus rate equalling 90M bit/sec.

Approvals for equipment that exceeds the performance thresholds in both List A and List B has not been changed.

As for on-site inspections, systems with performance ratings that exceed those set forth in lists A and B would require on-site inspection once a month for two years and quarterly for four years, the letter said.

The guidelines also require the end-user or importing agency to file with the Export Control Administration a detailed end-use statement with each export request, Collins indicated, although many manufacturers consider such documents useless paperwork.

Despite the new guidelines, most DP equipment will continue to be controlled, according to sources who have seen an export control list scheduled for release soon.

While some CRTs with limited capabilities and other electromechanical printers have been removed from the controlled list, the controllers that link them with CPUs were not, one source said.

Disk Course Goes on Road

CHATSWORTH, Calif. – A traveling course on the maintenance of Pertec D3000 disk drive series will be offered in five cities this summer.

The Peripheral Equipment Division of Pertec Corp. is offering the five-day course in Boston, Philadelphia, Dallas, Atlanta and Chicago.

Further information is available from Norm Ohren, Pertec, 9600 Irondale Ave., Chatsworth, Calif. 91311.

Another Way to Record Images

SAN JOSE, Calif. – Three IBM scientists have discovered a reversible electrochromic effect induced by light.

The approach records an image by exposing a film to a laser beam and initiates the development of latent images by switching on an electrical field.

The images, formed on a transparent liquid film containing organic molecules of a class known as pyrazoline, can be erased if the direction of the field is reversed, according to an article in *Applied Physics Letters.*

Exposure of the liquid to a laser beam produces a faint blue-green image that becomes darker when a developing field is turned on.

The solution retains the color even after the field is removed. If the direction of the field is subsequently reversed, the developed image disappears, making the recording solution available for many cycles of use.

The discoverers are M.D. Shattuck of the IBM Office Products Division here and R.V. Pole and G.T. Sincerbox of IBM's San Jose Research Laboratory.

A resolution of about 300 line/in. was achieved. The pattern formed was made by turning a scanning laser beam on and off at points corresponding to the beginning and end of lines.

The possibility of recording information with a finely focused deflectable laser beam gives the photo-induced electrochromism approach a higher image-forming resolution than matrix-type electrochromic displays in which picture elements can appear only at points in a predetermined grid, according to IBM.

The image formed in the IBM experiments was a 2-in. by 2-in. line pattern commonly used for testing the resolution and reproduction quality of photographic equipment.

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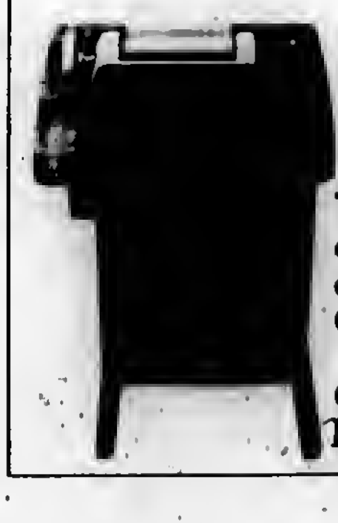

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Sees User Education as Priority

Qantel Plunging Into Distributed Processing Arena Soon

By Esther Surden
Of the CW Staff

HAYWARD, Calif. – Qantel Corp. will enter the distributed processing marketplace this summer, according to Noel O. Kile, vice-president of marketing for the firm.

Qantel markets through distributors an upwardly compatible line of small business systems designed for end users.

The systems already have communications capabilities, Kile said, but Qantel previously lacked the expanded maintenance capability to compete in the distributed processing arena.

"We have built up a bread and butter first-time user business," Kile said, and the distributed processing area is a "technical marketplace."

Business is rapidly expanding at Qantel with a comfortable order backlog developing, Kile said, but he admitted the firm was not always in such good financial shape.

Qantel started six years ago as a communications processor manufacturer. When the firm found it had to support a large service organization while spending $300,000 on software and $200,000 on hardware to make the processors, a second phase was initiated to market small business systems, he said.

A lot of confusion exists among end users when they go to purchase their first minicomputer-based business system, he said. First-time users don't know what kind of language they should look for or what kind of capacity a system should have.

"Whoever walks into the marketplace and clears up the confusion will capture most of the market," he commented, adding one direction the Qantel is headed in is giving its salesmen the tools to help educate the prospect.

In the future Qantel may be moving toward some specialized industry areas for growth potential, Kile continued. The firm is considering several of these markets in which the systems have been found to work well.

Qantel has an installed customer base of about 500 systems, he estimated. The systems are software-compatible with each other and most peripherals from one can be used on the other, he said.

The compatibility of the firm's minis makes it easy for the user to upgrade, Kile said.

Qantel's philosophy is that the first-time user should make an investment in hardware, systems designs, programming, procedures and operator training which is not obsoleted by any of the firm's systems, he added.

The System 950 is the companies hottest selling item, Kile said. The system can run up to four jobs simultaneously and can accommodate printers with speeds from 45 char./sec to 600 line/min, he said.

IBM Price Cuts Won't Affect Independents

(Continued from Page 85)

he said. For instance, the price of a 4M-bytc 158 dropped 10%.

On a 168 with 2M bytes, the drop was 2.86%; however, an 8M-byte 168 price dropped 13.3%, which amountcd to a $651,000 reduction.

The price changes afford ample oppottunity for speculation on why IBM chose this route, Bravo said. One possibility is that IBM is trying to encourage the purchase of 158s and 168s because the future systems are not as far off as some may have thought, he said.

The move could also be seen as recognition by IBM of its operating systems' voracious appetites for storage, he said.

On another track, Bravo opined that perhaps IBM is using its leverage on memory prices to become more competitive with other large mainframe suppliers such as Amdahl, Control Data Corp., Univac and Honeywell.

He doesn't see the price moves as attacks upon the independent memory makers with the exception of the 512K price.

"If I were to be rcal cynical and take my hard-nosed view of IBM's marketing strategies, I'd say it went out and looked at what the 512K was worth from independents and priced its the same."

IBM's new price on this unit is $85,000, which is what the independents have been charging, he said.

EMM is evaluating the IBM move and debating whether to cut its price on its 512K, keep the price the same and probably not have any demand for the unit or take the unit off the market. EMM will not cut the price if it finds it cannot obtain an acceptable margin, Bravo said.

The 512K market does not represent a large share to EMM, since it has only one installcd, he said. Most 158s will go to 1M byte when expanding memory, he said.

"We may want to adjust the 1M-byte number a little bit so it is more consistent with the decrease in the 512K price," he said.

Although the IBM price for a 1M-byte machine is now $170,000, which is "closer to EMM's normalized prices, it isn't so close that we'd consider changing it," he said. "We're still less than 80% of the IBM price.

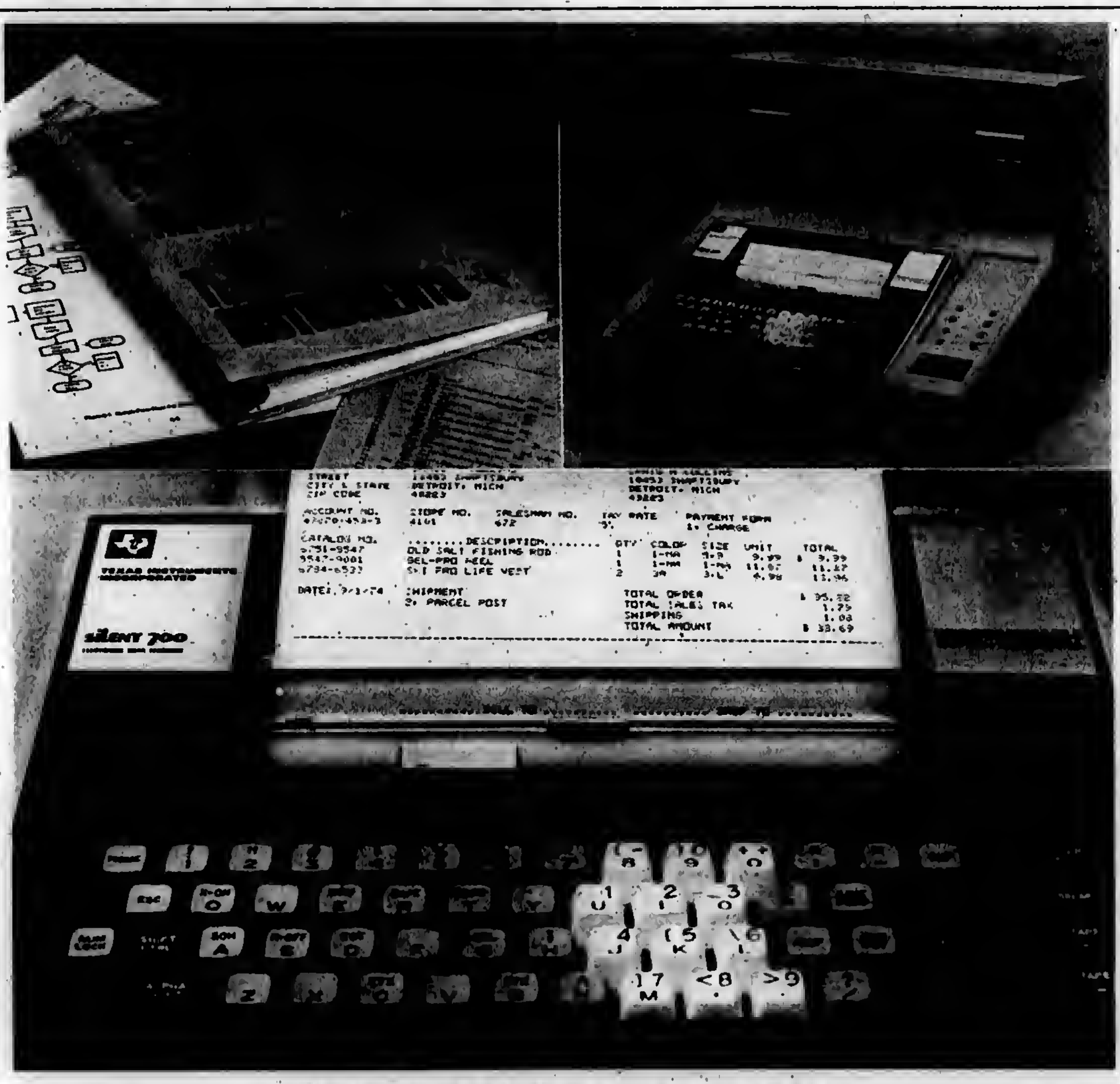
"The only thing we worry about is when [IBM is] going to do it again."

In its pricing, IBM multiplies the 512K unit price by four for a 2M-byte unit whereas EMM, for example, has a discount as the increment increases.

"Our pricing is a function of the total amount of memory you buy from us because you put the memory in the same box. So we don't price 1M byte at twice the 512K price, we price it at something like 90% or 80% of that."

One reason the price reductions don't appear constant is that !BM charges a $56,100 fee for increasing a 158 above 2M bytes and there is an $11,600 fee for a port above 2M bytes on the 168, Bravo said.

Above 4M bytes, the 168 owner pays $56,100 for alterations, he added.



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TEXAS INS

Sycor Directing 440 to Distributed DP System Users

By Molly Upton
Of the CW Staff

ANN ARBOR, Mich. – Although Sycor, Inc. is offering Cobol on its 440 clustered system, it is not directing the product to the small business market, according to the vice-president of marketing, Paul C. LaVoie.

Instead, Sycor is pursuing users in its traditional field of distributed data entry and processing, he said.

However, there may be some OEMs to whom the added Cobol capabilities are attractive, he remarked.

At the firm's annual meeting, President Samuel N. Irwin said he expects 1976 earnings and revenues to grow about 30% compared with those in 1975.

Shipments of the 440 are expected to reach 40 to 50 systems a month in June, Irwin said.

LaVoie said he expects most 440 installations with Cobol to use it for report generation, although the system could operate as a stand-alone processor, he said.

In addition, the firm also announced a 10M-byte disk of its own manufacture for the 440. Sycor sees customers wanting to put more applications and files at remote sites to interact with on a local basis.

Control Unit for Sycor 440

While a lot of people are talking about distributed processing, "we're fine tuning that a little bit," LaVoie said. "We're saying to a large extent the needs are filled with something we call transaction processing."

The additional 10M bytes is to help users who address themselves to transactional processing to meet growing needs.

Line entries are edited using Sycor's Tal language, and then the locally retained files are updated.

The firm also added two more floppy disk drives to the 350, for a total of 1M bytes of file space.

Evaluating New Concepts

Sycor is evaluating new concepts in floppy disk technology, including double-sided recording, but "we're not taking any action at this time," he said.

Shipments to Olivetti account for about 45% of revenues, and this figure is decreasing as the firm's lease base increases and its domestic marketing force grows, he said.

About half of Sycor's installed systems communicate with central computers, whereas the others communicate between other Sycor systems, he said.

CW Photos by M. Upton
Printer being assembled is used on terminal units and prints at 60-, 120- or 180 char./sec.

Order input for the 440 is "exceptionally strong" and the 350 and 250 are strong and very strong, he said.

Most revenues are still associated with batch-oriented systems such as the 340, 350 and 440, he said, and the mix has not changed appreciably.

255-2 Stand-Alone Terminal

Sycor also has the 215, which is an IBM 3270-compatible device. Order input and shipments for the first four months for the 215 have also been strong, he said.

Sycor aims for a slightly different user than IBM, he said, in that the user anticipates using the 215's microprocessor to increase the editing power. This could reduce errors and the requirement for retransmission of error blocks over the line, he said.

350s run diagnostics with floppy disk units.

"For instance, the first application may be inquiry response, but the user is looking toward utilizing the device for data entry," he said. Sycor can also put a floppy disk on the system, he observed.

Distributed processing, as La Voie sees it, is an offloading of editing tasks and working files to remote sites where the user is anxious to exercise more control over his operations.

(Continued on Page 90)

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Head-Per-Track Disk Carving Niche in Mini Mart

By Esther Surden
Of the CW Staff

CHATSWORTH, Calif. – The head-per-track disk has carved its own niche in the minicomputer add-on memory market, according to L.T. Lincoln, director of marketing for Alpha Data, Inc., an eight-year-old company marketing these disks.

The head-per-track disk has a place between floppy disks and moving-head disks in capacity, but is more reliable than either, Lincoln said.

"The industry will change in the next year," he predicted. Among the changes he forecasted were a move toward greater capacity through higher packing densities.

"People who buy our product need a faster access time, reliability and a fairly large capacity," Lincoln said.

"We don't even look at areas where there is competition with the moving-head disks," he said. "Forty million bits is our largest capacity while 40M bytes is nothing for a moving-head disk," he said.

Moving-head disks have slower access times, however, and "many applications cannot take a slow access time." Such applications include communications.

A large program that resides in moving-head disk can use head-per-track disk to give it increased throughput, Lincoln said.

Part of the program is swapped into head-per-track and, when finished, it is swapped back into moving-head memory, Lincoln said.

Alpha Data's business is 70% to 80% OEM with the remaining end-user, Lincoln said.

The firm clearly prefers to deal with the OEM customer because, Lincoln said, "you have to hold [end users'] hands."

Most end users want the supplier to provide the disk controller as well, he added, and, although Alpha Data will supply the controllers, it isn't in the controller business, he said.

Business this year is better than a year ago, Lincoln added. "There's been a general pick-up of interest," he added. "We've had some things going for several years that are finally coming through," he continued.

A good number of the firm's sales are in the refinery and geophysical industries, Lincoln added. The Alpha Data disks will work in hostile environments because of an enclosed chamber and a retractable head design. "Everyone else uses contact start and stop," he said.

The only moving parts were two bearings, Lincoln added. Microprocessors don't have too much of a posture in the disk arena, Lincoln said, because Cmos is too slow. "We are looking at faster chip technologies, however." Microprocessors do have a place in the controllers, he added.

"Now, I could make a million if I could make a low-cost head-per-track disk" as peripherals for microprocessors.

The problem with most microcomputer peripherals is that they are miniperipherals and are electromechanical in nature. "I don't see low-cost peripherals for micros in the electromechanical area in the near future because labor keeps going up and parts keep costing more."

An additional product marketed by Alpha Data is a disk exerciser designed for the firm's disks. "The tester could take off heavily," in the next year, Lincoln said.

The firm also makes an integrated circuit tester to evaluate Cmos, TTL and DTL circuits, he said.

Distributed DP Target of 440

(Continued from Page 89)

While central DP probably wants to lighten its load, distributed processing now does not necessarily include taking a stand-alone application like accounts receivable, payable or payroll and doing the whole job out there, he said.

"I think corporate headquarters is going to want a certain amount of control. Yet the equipment most vendors are supplying to this market is capable of doing those jobs. It's a sporty course," he said.

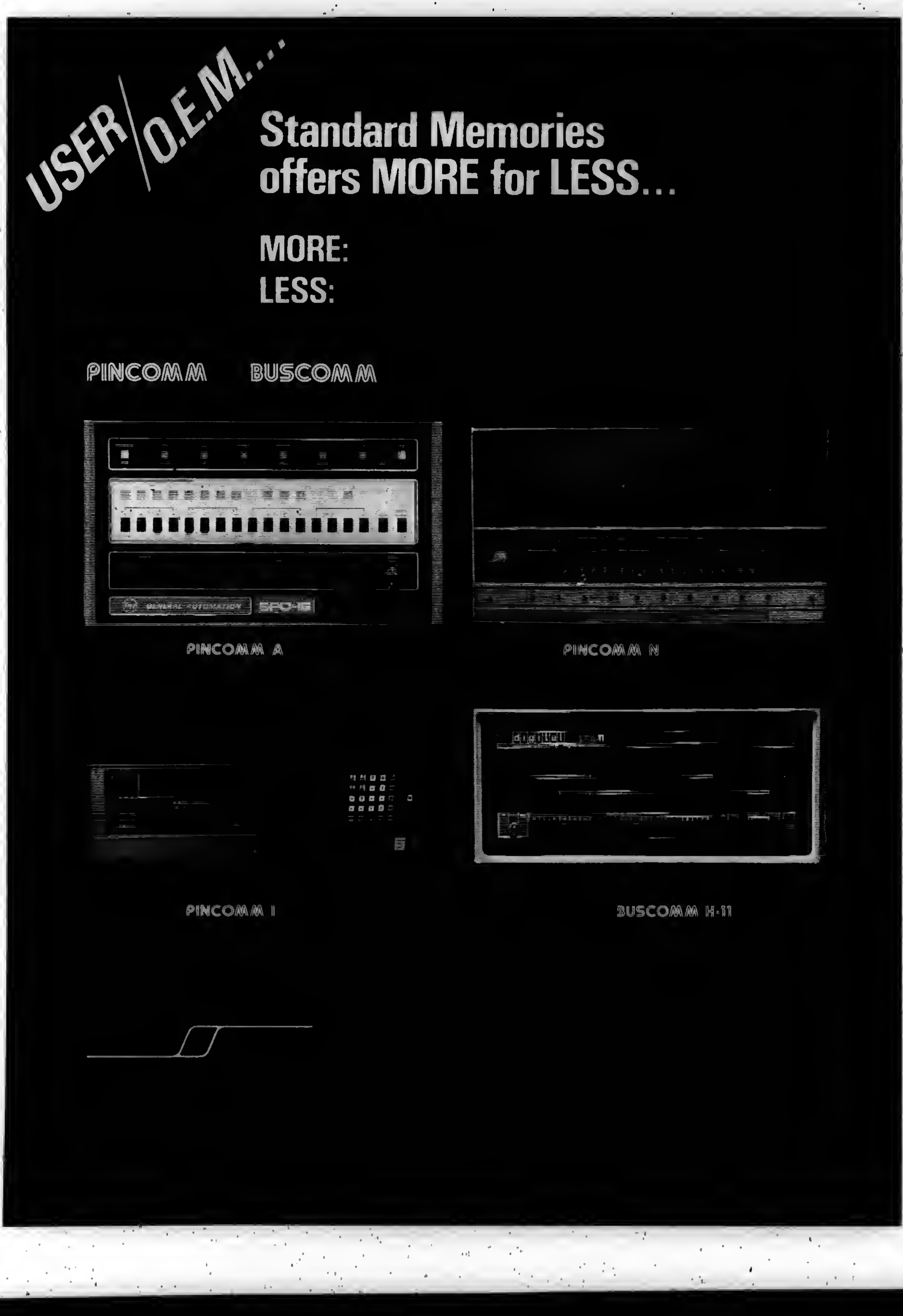
Other contestants in the distributed area are IBM, which is now advertising distributed processing with the 3790; Four-Phase Systems, Inc.; and Datapoint Corp. Still others in the arena are the mini companies.

Raytheon, Intersil Settle Litigation

LEXINGTON, Mass. – Raytheon Co. and Intersil, Inc. have settled out of court the long-pending litigation between them.

Under terms of the agreement, Intersil was granted a paid-up license to use without limitation all the semiconductor technology which was in dispute.

As a royalty payment for that license, Raytheon will receive a total of $500,000, payable over a four-year term. As an additional royalty, Raytheon will receive 120,000 shares of Intersil stock which Intersil may be obligated to purchase at a price of $10 per share between 1978 and 1983.



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Orders & Installations

Tennessee Forging Steel Corp. has installed a Burroughs B1726 to handle DP requirements for its three plants.

Brown Oil Tools, Inc. has installed a Burroughs B1726. On-line real-time production information will be handled through the Burroughs Production Control System and on-line order entry and accounts receivable inquiries will be achieved through the Burroughs On-Line Wholesale Distribution System.

Minneapolis' Red Owl stores have ordered Datachecker T-2500 and T-3000 electronic cash registers from National Semiconductor Corp. for 17 of its locations.

The SCM Corp. and General Electric's Transformer and Distribution Equipment Business Division have ordered factory data collection systems from Sierra Research Corp.

Sun Oil Co. has installed a Control Data Corp. Cyber 172 system.

Bernalillo County, N.M., has installed a Honeywell Model 6023 system for the tax assessor's office.

Raychem Corp. of Menlo Park, Calif., has installed two Burroughs B6700s, replacing a B4700 and some purchased computer time.

Ortloff Corp. has ordered a Univac 1100/10 computer system for project management, engineering design and general accounting applications.

The Air Force Military Personnel Center has installed a Grumman Data Systems Corp. printer controller which enables its Burroughs B6700 to interface with an IBM 1403-N1 printer.

Sun Chemical Corp. has ordered a Honeywell Series 60/Level 66 large-scale computer system and a Series 707 minicomputer.

San Diego City Schools has installed the first Telex 6330-11 direct-access storage system.

Computer Data and Optical Coating Co. have each ordered a V76 system from Varian Data Machines.

Ruppman Marketing Services, Inc. of Peoria, Ill., has installed a Burroughs B700 with Burroughs Business Management System program products.

The Associated Colleges of Central Kansas has ordered an S210 computer system from Harris Computer Systems for instructional, research and administrative purposes.

The Defense Mapping Agency (DMA) has ordered Staran processing equipment from Goodyear Aerospace for use by the Army's Engineer Topographic Laboratories to perform research for the DMA in cartography, digital photogrammetry and image processing.

Collett's Furniture, Inc. of Salt Lake City, has installed a Burroughs B1700 for inventory control, merchandise management and accounting functions.

The Texas Water Development Board has ordered a computer graphics DP system from Digital Resources Corp. to aid in the state's water resource planning and management.

Medical Data Services, Inc. has installed six Microdata Reality minicomputer systems and has ordered three more for use in clinic data processing.

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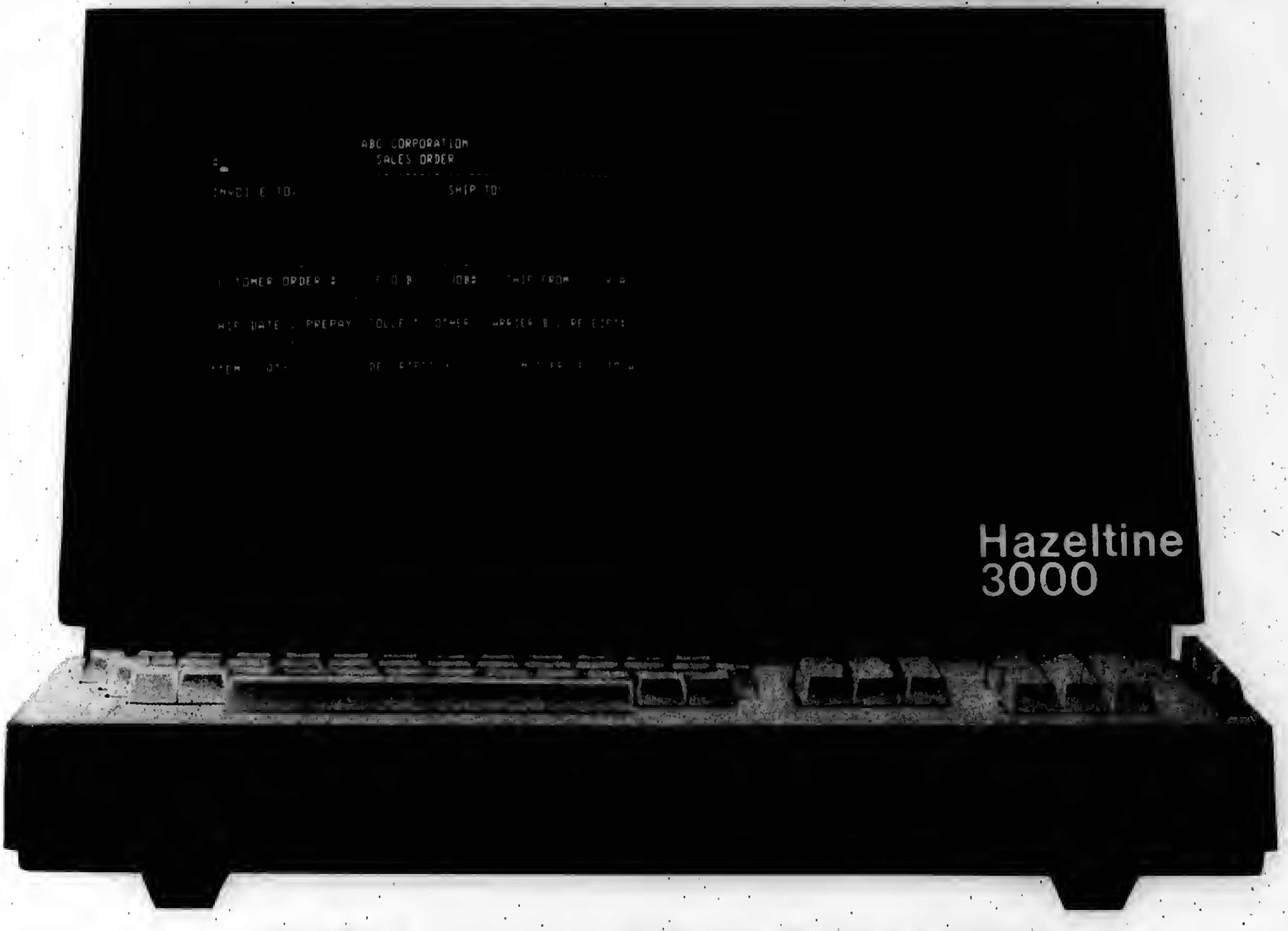

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Sees Costs Dropping

Tally Continues Emphasis on 300 Line/Min Printers

By Molly Upton
Of the CW Staff

BOSTON – Tally Corp. intends to continue its concentration on the 300 line/min and under printer market, which it expects will experience rapid growth but also increased cost competitiveness, according to President Leslie A. Larsen.

The firm will exceed, but not double, the growth rate in this area of the printer market, he told analysts at a recent meeting here.

Tally is gaining in market share, but not substantially, he said, adding he expects to see increased competition in the 200 line/min niche.

In turn, Tally has entered products such as its 120 char./sec and 300 line/min printers into other manufacturers' areas, he observed.

The future market will be characterized by demand for less expensive, more reliable printers, he said, adding the product "we sell for $3,500 will be $3,000 by the end of 1977."

Technologies Cutting Costs

Larsen believes the comb and serial matrix technologies incorporated in its printer products are lower cost and provide greater opportunity for profits than some other types of printing techniques.

In the past year Tally has cut costs on its T2000 by over 20% and has an in-house campaign to reduce costs by $5/week.

Its vertical integration and incorporation of the interface on the T1000's microprocessor are helping in this effort, Larsen said.

Other units will use microprocessors within a year, he added.

In addition to offering interfaces, Tally has emulators to make its printers look like those of other manufacturers. This enables users to change printer suppliers with a minimum of work, he added.

Larsen predicted that Tally's future products in the near term will come from an evolution of present products and that the firm will not venture into other product areas within the next two years.

Tally will derive about 75% of revenues from printers and printer supplies this year, he said. The firm also makes punch tape machines and key-to-tape units.

Tally has reduced its line of punch tape products to two, which should help increase profitability, he said. Two years ago paper tape business accounted for 25% of revenues, but this figure is now about 8%.

Recently Tally expanded its line with a serial printer, the T1000, which operates at 120 char./sec. Tally has a license from General Electric to manufacture the printer, which is currently being made in Italy, he said.

Tally has also announced the T4300, a 300 line/min printer using the same comb technology as the 200 line/min unit that comprises most of its installed base.

The comb technology can be the basis for an even faster printer, "but we are questioning whether we want to go faster than 300 line/min," Larsen said.

"Comb technology is extremely cost/effective in the high-speed range. The question is, is the market there?"

Although it could go slower than the 200 line/min, it is not cost-effective to do so, he added.

Larsen doesn't see encroachment from new technologies such as laser printing in the low-speed area – "certainly not for the next three years and probably not for five."

Doubts on Joint Ventures

Larsen expressed doubts about the long-range competitiveness of products from joint venture firms formed as part of the trend by mainframe manufacturers to vertically integrate operations.

Generally they start out with a good product but don't follow up well, he said, adding good management tends to be transferred into the main part of the company rather than staying with the printer or peripheral unit.

In addition, these units plan products according to the mainframer's specifications. But when product introduction time comes, the products often are not as competitive as what may be available from independents, he said.

About 55% of Tally's business in 1975 was overseas, and Larsen expects the same proportion this year.

The firm has 570 employees, with about 80 of these in Europe.

TRW to Help Distributors Gain Low-Rate Financing

LOS ANGELES – TRW Datacom International, Inc. has begun a program to help its worldwide distributors obtain financing at low rates, the firm said.

"TRW, with its international resources and international financing experience, can help its distributors get 180-day financing below prevailing rates in their own countries," according to James L. Kelly, vice-president of operations.

"We will assist the distributors in finding sources of financing and different mechanisms of financing at attractive rates which can be substantially below their own country's."

Piore Gets NAS Post Again

WASHINGTON, D.C. – Emanuel R. Piore, retired vice-president and chief scientist and a current member of the board of IBM, was reelected to a third four-year term as treasurer of the National Academy of Sciences (NAS).

Shippers Form Service Firm

NEW YORK – The American Bureau of Shipping has formed ABS Computers, Inc. (Abscomp) to provide services for both the parent firm and others.

Abscomp has an IBM 370/158 and is offering a range of services ranging from business accounting to engineering calculations and mathematical analyses, a spokesman said.

The firm is at 45 Broad St., New York, N.Y. 10004.

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Aims at Technological Advantages

SI Finds Niche in Mini Disk Market

By Esther Surden
Of the CW Staff

SUNNYVALE, Calif. – "I would start worrying about the future of disk technology when IBM starts peddling an alternative," Kent Winton of System Industries (SI) said in an interview here recently.

Most people wait until IBM legitimitizes the market, he added.

SI got into the minicomputer-compatible disk storage system market in 1970. "We really got into it because we wanted to use a disk ourselves," Winton said.

The company offers fixed and movable head type systems to Digital Equipment Corp. and Data General Corp. users, with a large part of its business aimed at first-time users.

"We also satisfy a narrow band of users – those too small to build their own electronics and those too big to take what the manufacturer sells them at a premium," Winton said.

More Aggressive

The company considers itself more aggressive in forging technological advantages than a mini firm that makes its own drives.

"Minicomputer manufacturers don't want to obsolete their investment," so they don't take the technological initiative, Winton explained.

IBM is doing a lot of worrying about DEC, Winton said, because IBM has always tried to get the customer his first computer.

SI's biggest customers use systems in business applications, Winton said. They are "OEMs in every sense of the word except they don't resell the equipment," he added.

Other large customer applications include use in the military and in text-editing systems, he said.

Winton predicts larger capacity disks in the future with more bits written on the same amount of space. "Within two years we'll find a single-spindle disk with a 1G-byte capacity," he added.

The company has little trouble getting customers to understand the mixed-vendor environment because "historically the people who grew up in the mini world are conditioned to think about more than one vendor," he said.

Lambert Firm to Make Newspaper Systems

MIAMI – Clark M. Lambert, a DP executive for *The Miami Herald* and Knight-Ridder Newspapers, Inc. for the past nine years, has resigned in order to form his own company, Circ, Inc.

The firm will develop, sell and install mini-based circulation systems for small and medium-sized newspapers, he said.

N.Y. Asks AMS to Design Systems

NEW YORK – The City of New York has awarded a $1.4 million contract to American Management Systems, Inc. (AMS) for the general design of computer-based accounting and financing management systems.

AMS has been asked to design a city expense budget structure and related control procedure, a payroll system and a citywide accounting system. The systems will be based on concepts developed by AMS in earlier work done for the city.

AMS will undertake design of the systems as a part of the city's Integrated Financial Management Task Force.

Other Awards

Scientific Micro Systems obtained a five-year contract from Western Union Data Services Co. to develop and manufacture advanced terminal control units.

Tri Data Corp., has received a $1.1 million contract from Teradyne, Inc. for its Cartrifile magnetic tape systems for use in Teradyne test systems.

General Systems International, Inc. (GSI) has received a development and leasing contract worth more than $1 million from Siemens AG for further development of the GSI 740 and GSI 540 key-to-diskette terminals, which are replacement units for the IBM 3740 and 3540 CRTs.

Paradyne Corp. has been awarded a $5.2 million follow-on production contract from the Data Transmission Co. (Datran) for 4,800- and 9,600 bit/sec LSI modems to be used in the Datran communications network.

Pertec Corp.'s Peripherals Equipment Division has been awarded a contract from Applicon, Inc. for digital magnetic disk drives.

Burroughs Corp. has been awarded a $3.5 million contract by the U.S. Coast Guard for the installation of the Mississippi River Vessel Traffic Service, a communications network, in New Orleans.

General Instrument Corp. has received a contract from the Maryland State Lottery for a computerized daily lottery system. The company's American Totalisator subsidiary will install and operate the system; about 300 ticket-issuing terminals will be placed in the state.

Contracts

Two divisions of Western Union, Inc. – National Sharedata Corp. and Distronics Corp. – have received extended facilities and service contracts from First Wichita National Bank and Water Control Products/N.A., Inc. respectively.

Western Union Data Services has received a three-year contract from Keydata Corp. for the maintenance of Keydata's 800 terminals.

Comshare, Inc. has been awarded a long term services contract from A.B. Dick & Co. to use the Comshare system for on-going applications in financial analysis, budgeting, sales reporting and quality control.

Comshare, Inc. has also received an estimated $1 million, two-year contract from Manufacturing Data Systems, Inc. to provide a second Xerox 940 computer system for dedicated service.

Inter-Continental Computing, Inc. has received a three-year contract from the South Carolina Credit Union League's DP affiliate, Cuac, Inc. for remote computing services.

Computer Sciences Corp. (CSC) has signed an initial three-year contract with Gardner-Denver Co. to provide automated services on CSC's Infonet network and to develop a system of computer programs and a data base to automate Gardner-Denver's order entry and distribution functions. CSC has also received a contract from Day & Zimmerman, Inc. to automate a materials-handling system.

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Using Government Formula Helps Dealers Set Prices

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – In government bids, the equipment dealer who consistently loses to the competition or ends up selling equipment outright when he really prefers to lease it probably doesn't analyze his prices the way the government does.

Many used DP suppliers never actually determine whether the lease plans they are offering the government are actually cheaper than the purchase plan over the systems life of the gear, Terry Miller, president of Government Sales, Inc., told a group of used equipment dealers here.

To estimate the actual cost by a discount factor of 10%, used to represent the cost of capital, for the entire "systems life" or, in other words, the period the agency wishes to use the equipment. Then the results are compared, Miller said.

For example, assume Agency X wishes to acquire a system for use over a six-year period and is offered four bids for the same type of gear:

- Plan A. A straight purchase plan, at $610,000, with a maintenance contract of $29,670/mo.
- Plan B. A lease to ownership plan with title transferred at the end of six years, at $12,000/mo., maintenance included.
- Plan C. A straight six-year lease, at $11,000/mo., maintenance included.
- Plan D. A lease with option to purchase after 18 months with 80% rental credit, at $13,000/mo. Maintenance is included until purchase option is exercised. Thereafter, maintenance is $29,670/mo.

Plan B is most attractive to the government, he said, and explained how the government would reach this conclusion.

In Vendor A's purchase plan the full price is paid at once, and maintenance is the only annual cost to be considered, Miller said. Since the vendor offers free maintenance for the first 90 days, maintenance costs only $22,253 that year, bringing the total cost over six years to $780,603.

But that's not how the government reads the numbers, Miller explained.

Government's Method

Instead, a federal agency would multiply that annual cost by an adjustment factor: .909091 for the first 12 months, .826446 after 24 months, .751315 after 36 months, .683013 after 48 months, .620921 after 60 months and .564474 after 72 months.

The adjusted total for the purchase plan is thus only $732,479 – quite a bit lower. In addition, this purchase plan offers the government a bonus – the residual value of the system at the end of its "systems life," he said.

The residual value is determined by multiplying the original purchase price by 20% and then by .564474, the adjustment factor after its sixth year of systems life. ($610,000 x .20 x .564474 = $68,866). This figure is then subtracted from the adjusted total revealing that the cost of this plan is more attractive – $663,613.

Lease to Ownership

In the case of lease to ownership, offered by Vendor B, the costs are the same each year – ($12,000 x 12, or $144,000).

When multiplied for six years in a row, the total cost is $864,000. However, when multiplied by the adjustment factor, the total cost is reduced to $627,157.

This plan, too, results in government ownership of the equipment, so residual value must be considered, as in the outright purchase plan offered by Vendor A. This calculation is done as indicated above, reducing the final cost to $558,291.

This is the typical plan offered by IBM, Miller explained.

The straight six-year lease, at $11,000/mo rent including maintenance over six years, offered by Vendor C, would cost $792,000. However, after multiplying the annual expenditure by the government's adjustment factor, the price is reduced to $574,896. There is no residual value since the vendor still owns the system, Miller explained.

Lease With Option to Buy

In the case of the system offered by Vendor D at $13,000/mo lease with an option to buy after 18 months, the figuring is a little more complex, according to Miller.

Assuming the same $610,000 purchase price, one might multiply the monthly rent of $13,000 by 18 and multiply the result by 80% to determine the credit the government could subtract from the original $610,000 purchase price and find the government could convert for $412,800.

Adding maintenance charges for the balance of the six-year system's life would give an unadjusted total of $790,315, more expensive than the purchase plan.

However, the govenment adjusts that figure to determine its true cost by multiplying the first year's cost by the adjustment factor (12 x $13,000 x .909091).

It then multiplies the second year's cost of $515,635 ($78,000 rent + $412,800 purchase conversion + $14,835 maintenance x .826446).

For the four subsequent years of the system's life, the government multiplies the annual maintenance cost of $29,670 by the adjustment figures mentioned above with the resulting cost of $645,690.

However, still to be considered is residual value, which the government figures as 20% of the original cost multiplied by the adjustment factor stipulated for the last year of the system's life (.564474) or $68,866.

The final cost to the government of this plan is thus reduced to $576,824 – a far better price than the straight purchase plan, he explained.

The $68,866 in residual value, computed as above, brings the cost down to $588,291.

Month	Factor	Month	Factor
00	1,00000	60	.620921
06	.953463		
12	.909091	72	.564474
18	.866784		
24	.826446	86	.505071
36	.751315	92	.481566
48	.683013		

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International News

On-Line Bank Not Seen Opening Japanese End-User Mini Market

TOKYO – Minicomputer suppliers are vying for one of this nation's most lucrative computer markets – the banking industry.

The National Credit Bank Association's data communications system, an on-line clearing system for bills and drafts, is scheduled to be inaugurated in October under the operation of the Nippon Telegraph and Telephone Public Corp. (NTT).

The system will connect more than 400 credit banks throughout the country with the association's headquarters here via private communications lines.

In line with this system, some 200 credit banks are expected to install minicomputer systems, the largest demand ever received for minicomputer systems in Japan, according to *EDP/Japan Report* (EDP/JR).

This is particularly significant since less than 50% of the total number of minis distributed in this country annually are to the end-user market and the remaining units are delivered either to OEM or other makers in the form of system components, which are more vulnerable to changes in the economic climate, EDP/JR said.

Minicomputer sales have suffered from a sluggish business year, largely because of a sharp decline in OEM business.

Winning banking orders will result in a considerable amount of credit for computer vendors for use in penetrating the business-oriented user market.

Software Development Minimal

Secondly, the type of application of the bank system is relatively simple and straightforward, requiring minimum software development. This should result in maximum profits for the vendors, EDP/JR said.

In addition to these benefits, the credit bank system is expected to offer unusually good opportunities for the penetration of foreign minicomputers into the semigovernmental computer project.

Minicomputer industry sources expect about half of all the 484 credit banks with outstanding deposits ranging from $66 million to $333 million will decide to use minicomputers, EDP/JR stated.

If all of the 200 or more credit banks with outstanding deposits in this range should install minis, the total value of the systems purchased will come to approximately $10 million.

At least four foreign suppliers are planning to participate in the bidding, including IBM with its 3/10 and System 7, Burroughs with its L2000, DEC with its PDP 11/40 and Phillips with its P300.

Domestic suppliers seen vying for the contract include Oki (Okitac 4300C), Hitachi (Hitac 10II), Nippon Electric Co. (M4/F) and Ricoh (Ricom 10S), among others.

Trade Show Slated in Australia

WASHINGTON, D.C. – An exhibition designed to provide U.S. computer and peripheral manufacturers with a springboard from which to penetrate the Australian market has been announced by the U.S. Department of Commerce.

The exhibit will be held Nov. 8-12 at the U.S. Trade Center in Sydney, Aust.

Commerce has identified several high-potential markets with the Australian market including minicomputers, storage equipment, peripheral controllers, data transmission equipment, I/O devices, terminals, communications processors and interface devices.

The Australian computer/peripheral market is currently valued at over $211 million. The U.S. is Australia's leading supplier with a market share of approximately 50%, according to a Commerce report.

However, this market is served by a large number of suppliers with the result that competition is intense, Commerce said. The UK is the major competitor, with West Germany and Japan strong in specific areas.

In order to maintain the U.S. share of the import market sector, which is growing at 20% annually, aggressive marketing is required, the report stated.

Production is negligible in New Zealand, Commerce said. Consumption during 1974 was about $14 million, of which the U.S. contributed about $4.2 million. An annual growth rate of 10% to 15% was predicted.

Additional information concerning the exhibition is available from the Office of International Marketing, D1B-233, U.S. Department of Commerce, Washington, D.C. 20230.

Foreign Orders & Installations

The Kao Soap Co. Ltd. of Japan has ordered a Univac 1100/21 to become part of its information system, which is used for integrating on-line physcial distribution, order entry and automated warehouse system.

Massey-Ferguson Industries Ltd. of **Canada** has ordered an **IBM 370/158.**

Pio Istituto S. Spirito Ed Ospedale Reunite di Roma, a group of eight hospitals in Rome, has installed a Univac 1106.

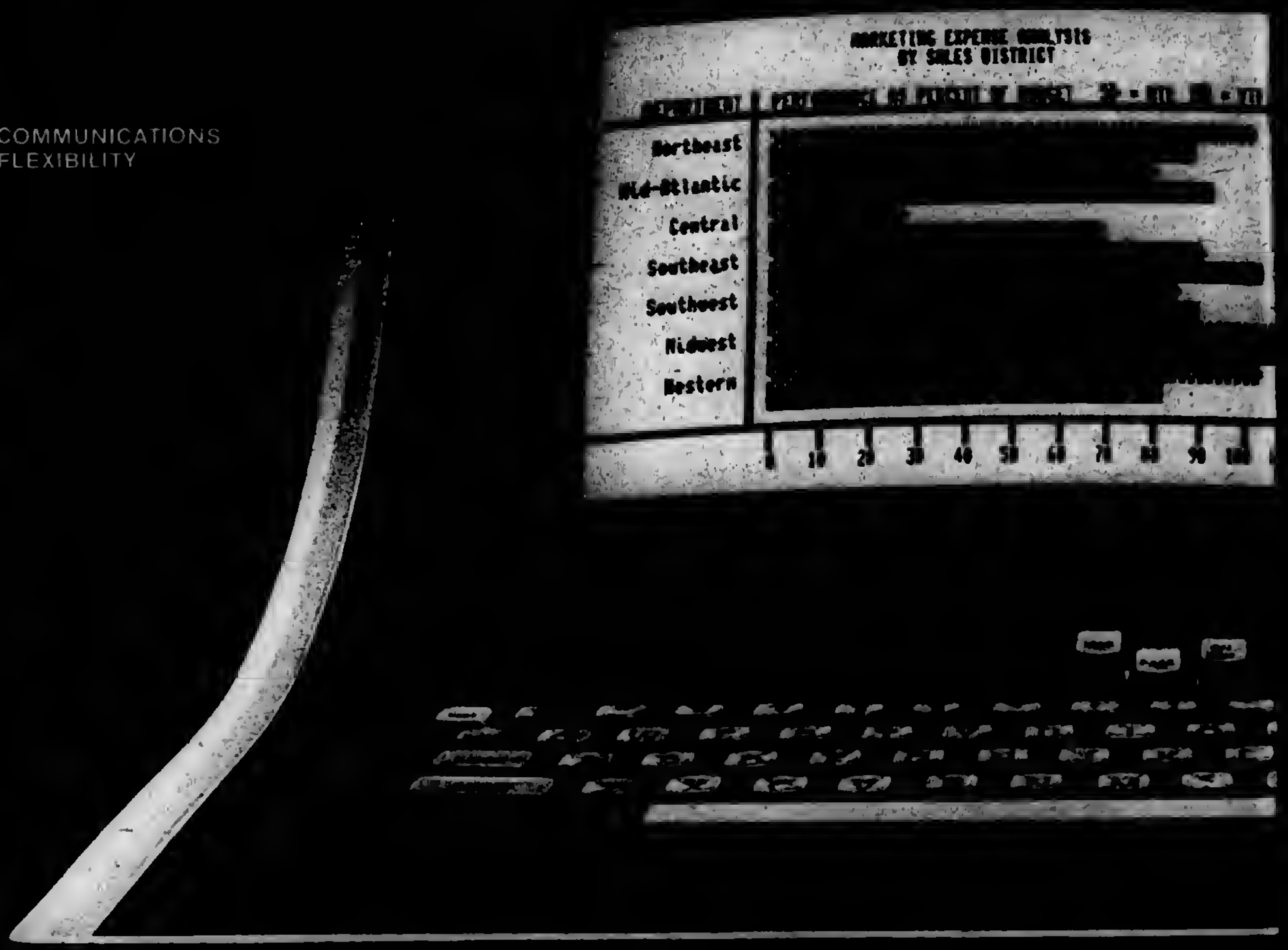
Centrais Electricas de Minas Gerais S.A., a Brazilian hydroelectric generating station, has ordered three HS4400 process computers from Honeywell to monitor six hydro-generating units.

Nippon Airways Co., Ltd. of Japan has ordered a Univac 1100/3 multiprocessor system.

Kingston-Sutton Joint Computer Committee, the computing center for the city governments of Kingston and Sutton in England, has ordered the Source Program Library Maintenance System (Slick) from National Computing Industries, Inc.

You can pay a lot for a
terminal that does a little
or you can pay a little
for a terminal that does a lot.

COMMUNICATIONS
FLEXIBILITY



ADDS 53 200

Nippon Modems Hit $33 Million

TOKYO – An estimated $33.3 million worth of modems were in operation in Japan at the end of 1975, according to *EDP Japan Report*.

Nearly half were provided and operated by the Nippon Telegraph and Telephone Public Corp. (NTT), the newsletter said.

Of the total non-NTT modem population, 80% were provided by domestic makers, which specialize in medium- to low-speed units operating at less than 2,400 bit/sec; the remaining 20% were from foreign suppliers, who dominate the high-speed market, the report said.

Among these foreign suppliers, Codex Corp. and International Communications Corp. maintained top shares, and industry observers estimated Codex will increase its share this year with its LS1 series.

Cincom Signs New Brazilian Rep, Sues Old One

By Eric Hippeau

Special to Computerworld

RIO DE JANIERO, Brazil – A Rio-based software vendor and consulting firm, Sistemas, Computacao e Informatica (SCI), has become the new Brazilian representative for all Cincom Systems, Inc. packages after the U.S. software house filed against its former representative, Deltacom do Brazil of Sao Paulo.

Industry sources said Cincom is charging Deltacom with breach of contract and failure to remit royalties.

Deltacom "could owe Cincom as much as $500,000," the source said. The suit has been filed in Sao Paulo; Deltacom spokesmen were not available for comment.

Under the contract signed March 23, SCI pledged to support and maintain all existing Cincom systems sold or rented before Jan. 16, when SCI first announced its association with Cincom.

According to Luiz Carlos R. Siqueira, SCI software vice-president, there are about 50 Total data base management packages installed in Brazil, but neither SCI nor Cincom knows exactly how many systems were placed by Deltacom.

International News

Siqueira is currently trying to locate those users in order to assure them of support and maintenance.

Royalty Payments

SCI and Cincom seem to have found a solution to the problem of royalty remittances, which has been causing headaches to a number of different software vendors in Brazil.

Under the arrangement, Cincom has incorporated a Brazilian subsidiary which will receive SCI's royalty payments – usually about 50% of the price of the software – in cruzeiros (the Brazilian currency).

In this way, SCI will not have to make any dollar transfers to the U.S., simplifying bureaucratic requirements and helping Brazil's balance of payments, Siqueira said.

For its part, Cincom will consider royalty payments made to its Brazilian subsidiary as a local investment, Siqueira said. This capital will be used at a later date in a possible three-way association between Cincom, SCI and the Brazilian government to develop a Brazilian software industry, he said.

ICL Sets Strong Plan For European Growth

PARIS – International Computers Ltd. (ICL) can be 100% on the offensive since its market share in Europe is a small 3%, according to Roger Houbert, head of ICL Europe, who noted that France is ICL's most important market, followed by Sweden, Germany and Holland.

Celebrating the delivery of its 1,000th Model 2903, ICL revealed revenues of $80.9 million, a profit of $7.3 million, a staff of 1,550 employees and an installed base of $368 million worth of equipment is the game plan for 1976.

In 1975, revenues were $69.9 million, Houbert said.

A feature of ICL growth in Europe has been the increase in revenue per employee, which more than doubled between 1970 and 1975 and is expected to nearly double again by 1980, when profits will be about $29.4 million, according to a report by *EDP/Europa Report* (EDP/ER).

ICL's key product in the European market is the 2903, of which 299 have been installed and another 129 are on order. Sales of 2903s in 1976 are expected to represent $29.4 million out of total sales of $80.9 million, EDP/ER said.

DEC Studying Possibility Of Manufacturing in Brazil

By Eric Hippeau

Special to Computerworld

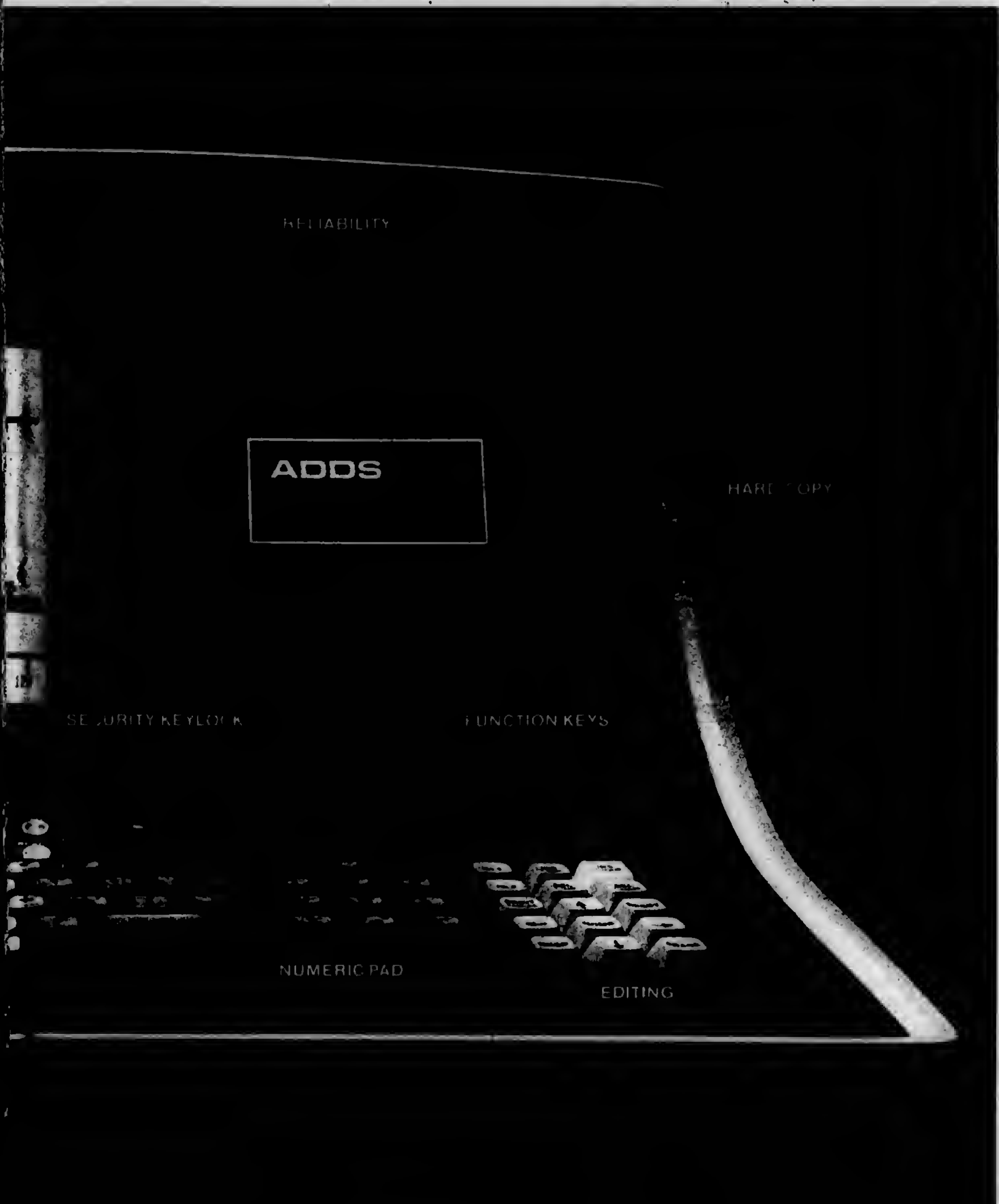
RIO DE JANEIRO, Brazil – The Brazilian subsidiary of Digital Equipment Corp. has negotiated two high-level market studies worth about $50,000 to determine the viability of manufacturing or assembling DEC equipment in this market, according to Digital Equipment Ltd.'s general manager, Jarry Hays.

A Brazilian manufacturing or assembly plant is the solution to the government-imposed stiff import restrictions on all DP equipment passed last December, Hays said.

Besides producing for the local market, the plant would also generate about $20 million a year of export orders from the rest of Latin America and Japan, according to Hays' estimates.

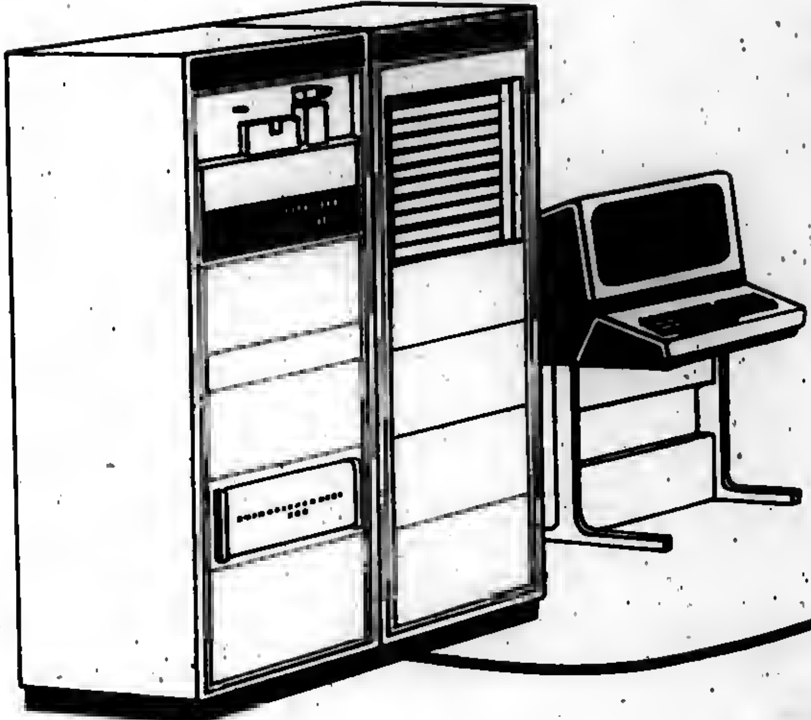
DEVOTED DPER

This gold-finished plaster sculpture symbolizes the DP professional's computer fixation. Six inches long, this hefty paperweight-conversation piece is priced at $9.95, postpaid, from Brian Productions, 2949 Southfield Rd., Xenia, Ohio 45385. Satisfaction guaranteed.



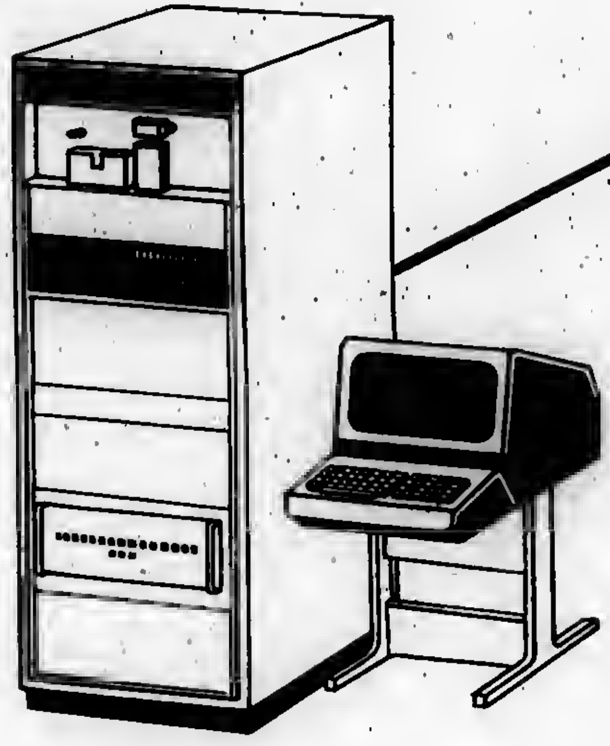
ADDS Applied Digital Data Systems Inc.

There's been a lot of talk Hewett-Packard's



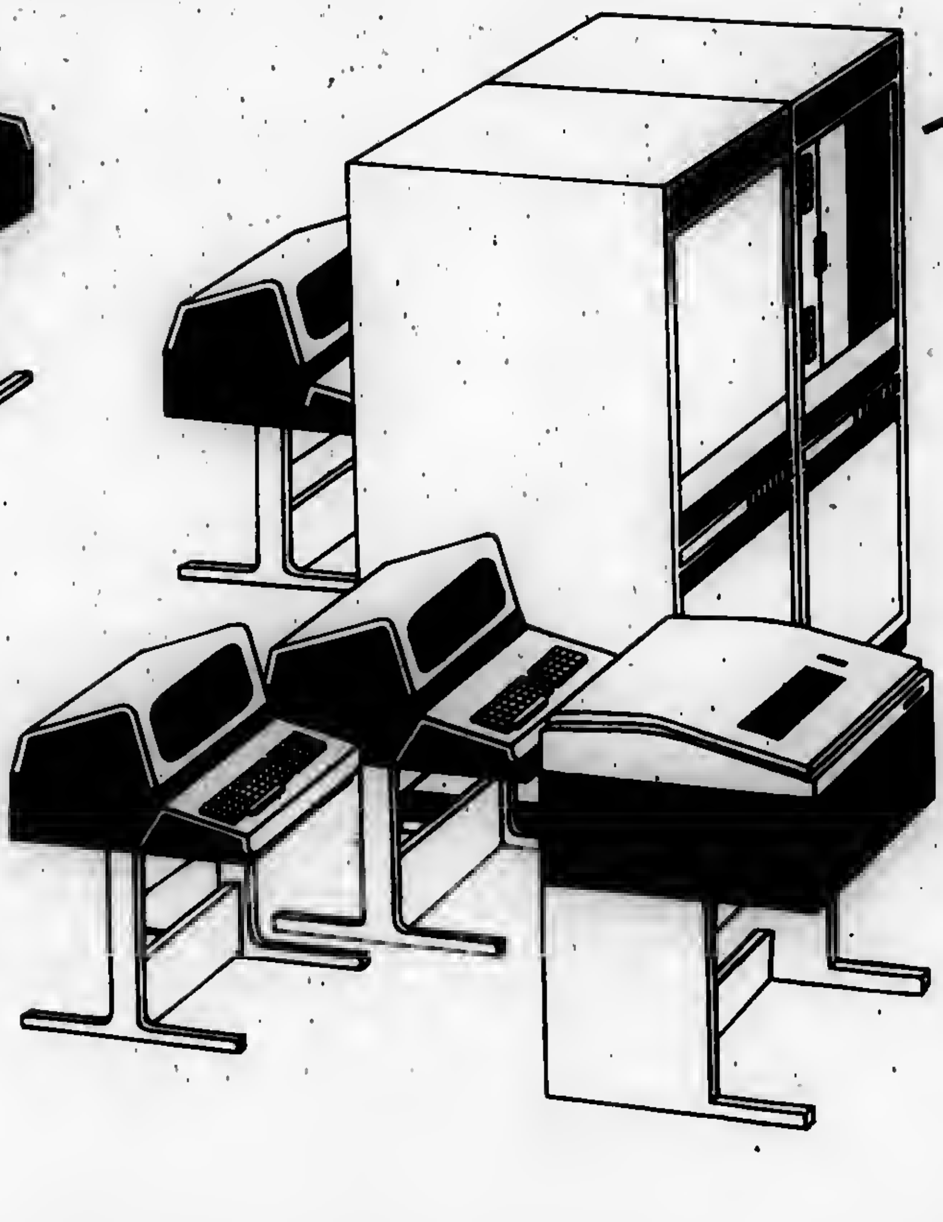
Measurement and Control Satellite

- Satellite Initiated Communications
- Central Program Scheduling
- Synchronous or Asynchronous Data Transfer
- Automatic Retransmission on Parity Errors
- 1,000 Kbps at 600′ Hardwired



Production Information Satellite

- Use of Central Peripherals
- Program Development at Central
- Program Storage at Central
- Program Test-Execution on Central
- RJE to Central
- RJE to IBM



Data Entry Satellite

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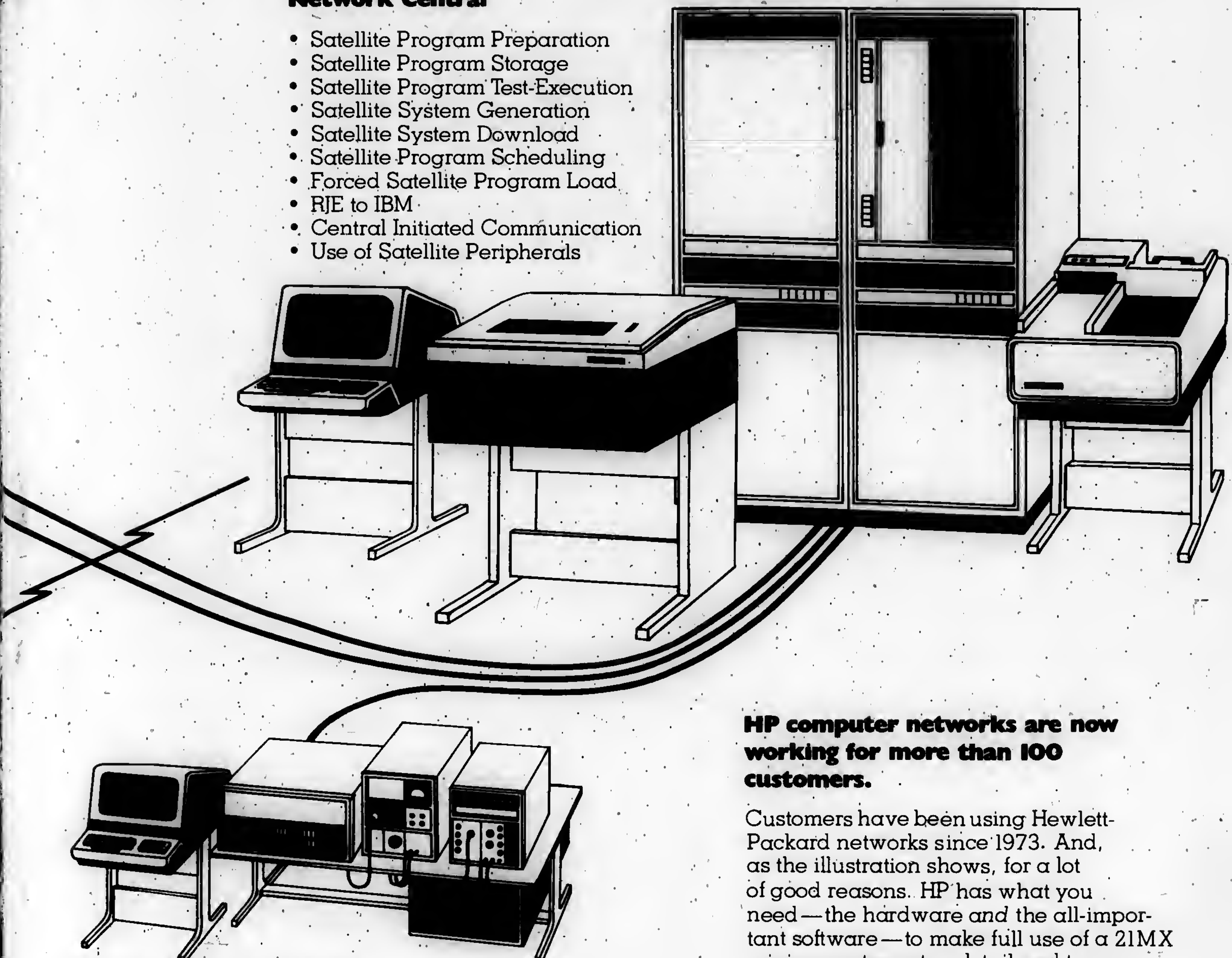
- Line Diagnostics for Line Status

about computer networks. speaks for itself.



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- Satellite Program Storage
- Satellite Program Test-Execution
- Satellite System Generation
- Satellite System Download
- Satellite Program Scheduling
- Forced Satellite Program Load
- RJE to IBM
- Central Initiated Communication
- Use of Satellite Peripherals

Lab Computation Satellite

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- System Download from Central
- Use of Central Peripherals
- Program Development at Central
- Forced Satellite Program Load
- Hardwired to 10,000′
- Remote File Access

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Three Phoenix Head Hits U.S. Policy on DP Exports

PHOENIX – Arbitrary trade restrictions imposed by the U.S. government on manufacturers of computers and related products have added to this country's economic woes, according to Donald E. Oglesby, president of Three Phoenix Co.

"I don't think our own [congressional] representatives are aware of the problems. They are not aware of the magnitude of the business lost by U.S. companies," Oglesby said.

Three Phoenix manufactures computer disk testers and tape drives for minicomputers.

"If we had freer trade, we could change the employment picture of the country drastically," Oglesby stated.

U.S. companies lose many sales each year to Western European firms that sell to their Eastern Bloc neighbors – U.S. companies cannot compete favorably in the international market, he said, because the U.S. government fears too much technology will go along with the sales.

There's never been a doubt Western countries limit the flow of technology from West to East in the computer field, especially if products have military applications, he said.

But the efforts of the West haven't slowed Soviet research and development, he added, because the East has developed computer systems that approach the sophistication of mid-level U.S. products.

Oglesby also maintained U.S. companies are losing valuable sales to both East and West Europe because the U.S. government won't permit sales of obsolete equipment, which in some cases have been blocked for several years even though there are no buyers in the U.S.

Penisten Quits Datran Presidency; Wyly Elected to Take Over Post

Glenn E. Penisten has resigned his post as president and chief executive officer of Data Transmission Co. (Datran) but will continue an association with the firm as vice-chairman of the board of directors. Concurrently, Sam Wyly, chairman of both Datran's board of directors and its parent company, Wyly Corp., has been elected to assume Penisten's position as president and chief executive officer.

Other Moves

- B. Allen Lay has been named senior vice-president and general manager of the CMC Group.
- Three persons have been appointed division vice-presidents at Pertec Business Systems. Dr. John E. Belt has been named engineering division vice-president; Paul A. Busse was also named a vice-president; and Donald F. Orr, formerly president of CMC International, has been named vice-president of marketing.
- Donald B. Bonstrom has been named vice-president of research and advanced design at Control Data Corp.
- James E. Williams has been appointed vice-president of finance for the Field Engineering Division of Itel Corp.
- Takeo Shiina has been elected to the board of directors of IBM World Trade Americas/Far East Corp. Shiina is president of IBM Japan Ltd. and a member of its board of directors.
- Steven R. Gerbsman has been appointed vice-president of the Computer Products Division for Itel Corp.'s Data Products Group.

Executive Corner

- John W. Schneider resigned from his position as vice-president of marketing at Interdata Corp. He will serve in a corporate staff position temporarily and James Bruno, executive vice-president, will handle marketing functions until a successor is named, an Interdata spokesman said. In addition, Interdata has named Joseph Rechner vice-president of customer service.
- Lee N. Rubin has been appointed vice-president of operations at Diva, Inc.
- Edward C. Becker Jr. has been appointed vice-president of data centers for Greyhound Computer Corp.

Earnings Reports

WALLACE BUSINESS FORMS
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.68	$.68
Revenue	19,813,000	18,852,000
Earnings	1,339,000	1,273,000
6 Mo Shr	1.25	1.20
Revenue	37,571,000	34,149,000
Earnings	2,455,000	2,234,000

TRILOG ASSOCIATES
Three Months Ended Jan. 24

	1976	1975
aShr Ernd	.....	$.02
Revenue	$525,574	471,658
Tax Item	(3,649)	12,948
Earnings	(16,163)	25,791
a6 Mo Shr	.....	.06
Revenue	1,060,956	971,752
Tax Cred	.....	29,486
Earnings	(878)	72,782

a-Restated to reflect nine-for-one stock distribution of Oct. 3, 1975.

TELECREDIT
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.19	.....
Revenue	3,084,188	$1,932,053
Spec Item	a110,000	(55,000)
Earnings	224,269	(110,700)
9 Mo Shr	.59	.09
Revenue	8,463,654	6,094,215
Tax Cred	329,000	46,500
Earnings	670,100	96,350

a-Tax-loss carryforward.

APPLIED MAGNETICS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.07	$.04
Revenue	15,572,000	16,306,000
Earnings	302,000	170,000
6 Mo Shr	.10	.06
Revenue	29,575,000	31,943,000
Earnings	421,000	262,000

POSITION ANNOUNCEMENTS

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WE're looking for an individual with a thorough knowledge of the peripheral market, including existing Digital peripherals and plans for future peripheral products.

You'll be extensively interfacing with vendors and should have a working knowledge of inventory control. You'll be involved with in-house management, working with marketing strategy, developing sales guides and should be capable of initiating and implementing creative marketing programs.

You should be able to determine peripheral needs, and coordinate with production and inventory control in the promotion, selling and shipping.

You'll need at least 5-6 years experience within the industry.

Complex Systems Market Consultant

This is a highly technical software as well as hardware marketing oriented position. You will be required to participate in developing and evaluating new products in both areas. Responsibilities involve interfacing with sales people and customers in order to determine hardware/software needs, then communicate these needs to hardware engineers and software designers so that a product may be designed to meet the customers requirements.

You must have DECsystem-10 experience and be familiar with DECsystem-10 software and hardware. This position requires 30-50% travel.

Special Terminals and Communications Product Manager

You'll be involved with the development of remote line concentrators, special terminal offerings and IBM interfaces.

You should have in-depth knowledge of data communications, computer networks, remote concentrators, Digital and IBM protocols, as well as state-of-the-art information on terminals and remote concentrators.

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To qualify, you must have 2-3 years with assembly language programming. Basic experience with a large scale multi programming operating system, preferably the DECsystem-10 desirable, but not mandatory. A BS in Computer Science or equivalent preferred.

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Reports to Executive Vice President and responsible for IBM 371-15 computer center and related equipment, operating under DOS/VS/POWER. Requires development, analysis, and design of broad educational administrative applications, and coordination with academic departments. Qualifications: bachelor's degree, knowledge of on-line applications, and high level languages. Salary range: $20,000-$22,500 plus liberal fringe benefits. Resume and salary history to: Personnel Director, Saint Peter's College, 2641 Kennedy Boulevard, Jersey City, N.J. 07306. *St. Peter's is an Affirmative Action-EEO Employer.*

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Dr. Warren Harden
Chairman, MICC Operating Board
Office of Institutional Research
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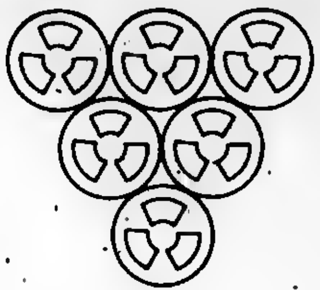

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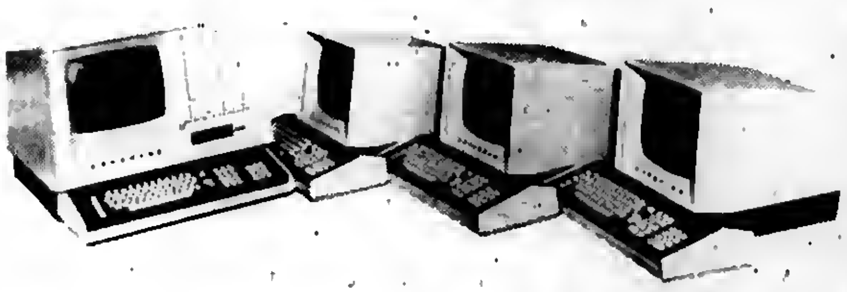

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Datapoint Gains 47% in Nine Months

SAN ANTONIO, Texas – Datapoint Corp. reported improved earnings and revenues in the third quarter and nine months ended April 30.

Prior to tax credits, earnings in the three months rose 59% and in the nine months 47%.

For the third quarter, Datapoint earned nearly $1.7 million or 54 cents a share compared with $1.1 million or 50 cents a share in the year-ago period, when there was a $336,000 tax credit.

Revenues rose to $19.5 million in the three months compared with $12.3 million in the same period last year.

Nine-month earnings rose to almost $4.6 million or $1.61 a share compared with $3.1 million or $1.48 a share in the same year-ago period.

Tax credits during the nine months were $495,000 in the 1976 period and $975,000 in the 1975 period.

Revenues during the nine months rose 52% to $50.6 million compared with $33.2 million in the same period last year.

The purchase value of equipment shipped for sale or lease during the nine months rose 56% to $102.6 million compared with $65.7 million a year earlier.

MAI Posts Record for Second Quarter

NEW YORK – Management Assistance, Inc. (MAI) scored record revenues and earnings for the second quarter ended March 31.

The company anticipates a continuation of its record performance for the remainder of the year, according to Raymond P. Kurshan, MAI chairman.

Bolstered by sales of Basic/Four systems, revenues grew to $28.7 million compared with $21.9 million in the year-ago quarter. Sales of Basic/Fours accounted for $13.7 million and $9.1 million respectively.

Although sales of Basic/Four systems were up 51% compared with the year-ago period, they were down 4% from the preceding first quarter.

This drop was caused by revenues recorded in the first quarter from a single sale of 11 systems and to delays in deliveries by suppliers, thus deferring certain system installations and billings to the third quarter, the firm said.

During the quarter the firm earned $3.1 million or 10 cents a share including a $1 million tax credit compared with $383,000 or 1 cent a share in the year-ago period, when the tax credit of $209,000 failed to offset a $592,000 write-off of a settlement agreement receivable from Potter Instrument, Inc.

A change in accounting for translation of foreign currencies reduced the year-ago quarter's income by $181,000 while increasing the 1975 half-year earnings by $269,000, the firm said.

For the six months, revenues rose to $57.1 million compared with $44.8 million.

Half-year earnings totaled $6 million or 20 cents a share, including a $2.6 million special credit, compared with $2.4 million or 8 cents a share when the special items netted out to $110,000.

Data Disc Suffers Loss in Quarter

SUNNYVALE, Calif. – Consistent with its operating plan, Data Disc, Inc. reported a loss of $328,000 or 30 cents a share for the first quarter ended April 2.

The firm had forecast such a loss previously and said it is continuing to invest resources in the engineering and manufacturing areas, as well as other operating areas, which will produce new products, improved services and lower manufacturing costs in the latter part of the year.

Revenues dropped slightly to $1.65 million from $1.69 million in the same period last year, when the loss was $96,000 or 9 cents a share.

The combined backlog of Data Disc and subsidiaries as of April 2 was $2.8 million compared with $2 million at the end of the year-ago quarter.

GA Anticipating Third-Quarter Loss

ANAHEIM, Calif. – General Automation, Inc.'s (GA) third-quarter revenues may well be down to about $14 million, resulting in a loss for the quarter, Chairman Lawrence A. Goshorn said.

However, GA still expects to achieve its "turnaround year" goal of profitability, he added.

The expected decline in revenues stems from a slippage in shipments into the fourth quarter, when shipments are expected to set a record.

"Results for the third quarter should not be construed as a trend," Goshorn said. "The decline in revenues is a direct result of some fundamental operational changes that had to be made to keep the commitment to our shareholders to improved margins and profits and a strengthened balance sheet."

New Registrations

INFORMATION MAGNETICS CORP., 5740 Thornwood Drive, Chicago, Ill. 60648, manufacturer of magnetic disk and tape recording heads and linear motors, filed to register 816,021 shares of common, of which 550,000 are to be offered on behalf of the company and 266,021 on behalf of selling stockholders. Underwriters are C.E. Unterberg, Towbin & Co., 61 Broadway, New York, N.Y. 10006 and Hambrecht and Quist, 235 Montgomery St., San Francisco, Calif. 94104.

CONTROL DATA CORP., 8100 34th Ave., S. Bloomington, Minn. 55420, a computer firm, filed to register 67,675 shares of common. No underwriter is involved.

COMPUTER AUTOMATION, INC., 18651 Von Karman Ave., Irvine, Calif. 92713, a minicomputer manufacturer, filed to register 40,834 shares of common, which may be offered for sale from time to time by certain stockholders at prices current at the time of sale. No underwriters are involved.

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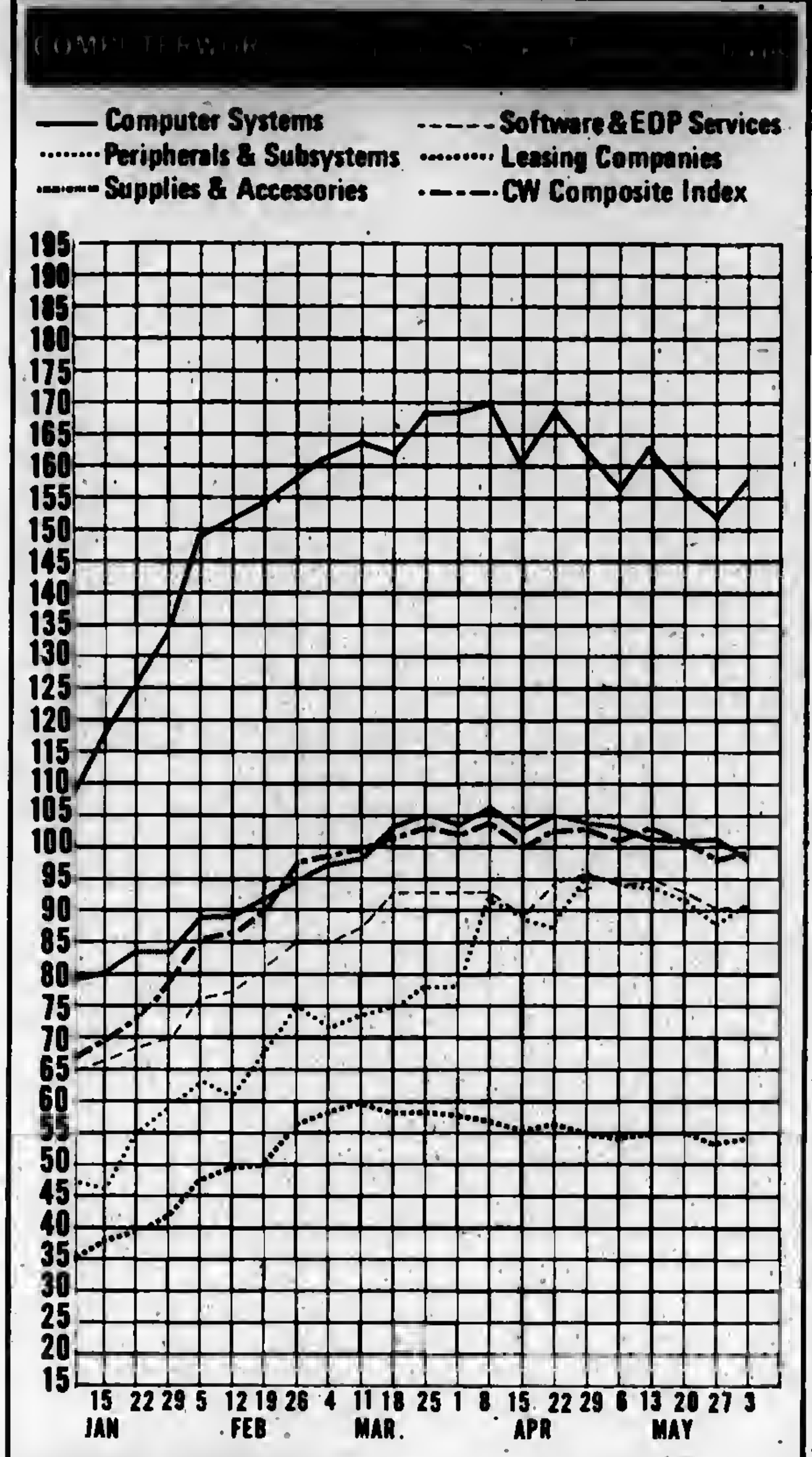

Earnings Reports

AUTOMATIC DATA PROCESSING
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.64	$.48
Revenue	49,246,000	39,716,000
Earnings	4,600,000	3,371,000
9 Mo Shr	1.73	1.39
Revenue	135,563,000	112,542,000
Earnings	12,514,000	9,705,000

a-Restated for pooling-of-interests acquisition.

TELECOR
Three Months Ended Feb. 29

	1976	1975
Shr Ernd	$.20	$.06
Revenue	15,742,264	11,487,475
Earnings	554,082	163,153
9 Mo Shr	.84	.69
Revenue	57,585,860	49,645,343
Earnings	2,329,843	1,921,614

CENTRONICS DATA COMPUTER
Three Months Ended March 31

	1976	1975
Shr Ernd	$.61	$.41
Revenue	13,503,054	10,704,217
Earnings	2,954,991	1,959,486
9 Mo Shr	1.61	1.17
Revenue	37,906,998	30,969,745
Earnings	7,753,581	5,587,746

DOCUTEL
Three Months Ended March 31

	1976	1975
Shr Ernd	$.24	$.02
Revenue	8,247,000	5,812,000
Tax Cred	313,000	29,000
Earnings	614,000	63,000

ENNIS BUSINSS FORMS
Year Ended Feb. 29

	1976	1975
Shr Ernd	$1.22	$1.54
Revenue	55,262,305	58,919,288
Earnings	2,800,626	3,579,862
3 Mo Shr	.39	.25
Revenue	13,686,534	14,037,924
Earnings	897,809	565,503

GRAHAM MAGNETICS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.16	$.18
Revenue	3,939,402	3,635,095
Earnings	150,001	167,811
9 Mo Shr	.80	.88
Revenue	12,114,012	11,883,388
Earnings	750,564	830,793

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 2, 1578

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1978 RANGE 111	CLOSE JUNE 2 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-1C8	57	+1 3/P	+1.4
C	COMPUTER AUTOMATION	10- 19	14 5/4	- 1/4	-1.8
N	CONTROL DATA CORP	18- 27	21 1/8	+ 1/2	+2.4
N	DATA GENERAL CORP	40- 80	49 1/2	- 7/8	-1.7
O	DATAPOINT CORP	24- 45	57 1/2	-1 1/4	-3.2
O	DIGITAL COMP CONTROL	2- 4	5 5/8	- 1/8	-3.3
N	DIGITAL EQUIPMENT	158-181	163 1/2	+3 1/2	+2.1
N	ELECTRONIC ASSOC.	2- 5	5 1/8	+ 1/8	+4.1
A	ELECTRONIC ENGINEER.	7- 18	15 3/8	+1 3/8	+5.8
N	FOXBORO	28- 42	42 3/8	+1 5/4	+4.3
O	GENERAL AUTOMATION	5- 11	7 5/4	+ 1/4	+3.5
C	GRI COMPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	HEWLETT-PACKARD CO	95-117	108	+5 1/2	+5.3
N	HONEYWELL INC	54- 58	47 5/8	+ 1/4	+0.5
N	IBM	227-272	257 1/2	+7 1/2	+3.0
O	MANAGEMENT ASSIST	1- 3	2 1/8	+ 1/8	+8.2
C	MEMOREX	18- 35	28	+ 1/2	+1.8
O	MICRODATA CORP	10- 28	18 5/8	+ 3/4	+4.1
O	MODULAR COMPUTER SYS	9- 13	11 1/2	+ 5/4	+6.9
N	NCR	24- 31	28 3/8	+ 3/8	+1.3
O	PRIME COMPUTER INC	4- 11	9 1/4	0	0.0
N	PERKIN-ELMER	19- 27	21 7/8	- 3/8	-1.8
N	RAYTHEON CO	45- 55	55	+1 5/4	+3.2
N	SPERRY RAND	4C- 50	47	+ 1/4	+0.5
O	SYCOR INC	20- 31	24 1/2	- 1/4	-1.0
A	SYSTEMS ENG. LABS	8- 10	8	- 1/4	-3.0
N	VARIAN ASSOCIATES	13- 17	14 1/4	+ 5/8	+4.5
A	WANG LABS.	11- 20	11 5/4	+ 1/2	+4.4

LEASING COMPANIES

EXCH		PRICE 1978 RANGE 111	CLOSE JUNE 2 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	5 3/4	- 3/4	-11.5
A	COMMERCE GROUP CORP	2- 3	2 5/8	C	0.0
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	0	0.0
N	DATRONIC RENTAL	1- 1	1 1/8	+ 3/8	+50.0
A	CCL INC	1- 1	5/4	+	+9.0
N	DRF INC	5- 7	5 5/8	0	0.0
A	GREYHOUND COMPUTER	3- 8	7 1/8	- 1/8	-1.7
N	ITEL	6- 13	11 1/2	+ 1/4	+2.2
N	LEASCO CORP	6- 14	11 5/4	+ 5/8	+5.6
O	LEASPAC CORP	0- 1	1/4	0	0.0
C	NRG INC	1- 1	1/2	0	0.0
A	PIONEER TEK CORP	6- 9	7 5/8	- 1/2	-6.1
N	U.S. LEASING	7- 12	9 1/4	- 1/8	-1.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
111 TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1978 RANGE 111	CLOSE JUNE 2 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/4	0	0.0
A	APPLIED DATA RES.	2- 3	2 3/4	0	0.0
N	AUTOMATIC DATA PROC	54- 87	67 1/8	+2 1/4	+3.4
O	COLEMAN AMERICAN COS	4- 8	5 1/2	0	0.0
O	COMPUTER DIMENSIONS	3- 7	5 1/8	- 1/4	-4.8
C	COMP ELECTION SYSTMS	5- 9	7 5/4	- 1/4	-3.1
O	COMPUTER HORIZONS	1- 2	5/4	- 1/4	-25.0
O	COMPUTER NETWORK	2- 6	4 1/4	+ 1/8	+5.0
N	COMPUTER SCIENCES	4- 8	6 1/4	0	0.0
O	COMPUTER TASK GROUP	1- 1	1 3/8	0	0.0
C	COMPUTER USAGE	3- 8	5 1/4	- 3/8	-10.3
O	COMSHARE	2- 8	7 1/2	+1 3/4	+50.4
O	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	12 1/4	- 1/4	-2.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IRS COMPUTER MARKET.	1- 2	1	C	0.0
C	KEANE ASSOCIATES	2- 4	3	0	0.0
O	KEYDATA CORP	3- 5	2 5/8	0	0.0
C	LOGICON	4- 4	3 5/4	C	0.0
A	MANAGEMENT DATA	1- 3	2 1/4	+ 1/8	+5.8
A	NATIONAL CSS INC	15- 25	19 3/4	- 1/8	-0.8
A	ON LINE SYSTEMS INC.	18- 22	19 1/4	+ 1/8	+0.6
N	PLANNING RESEARCH	3- 5	5 5/8	0	0.0
C	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	2 5/4	+ 1/8	+4.7
O	REYNOLDS & REYNOLDS	15- 21	17	+ 1/4	+1.4
C	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	19- 28	25 7/8	0	0.0
A	URS SYSTEMS	5- 5	4	+ 1/8	+5.2
N	WYLY CORP	3- 7	3	- 1/8	-4.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1978 RANGE 111	CLOSE JUNE 2 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	8 7/8	0	0.0
O	ADVANCED MEMORY SYS	4- 10	7	- 1/2	-8.6
N	AMPEX CORP	5- 8	7 1/4	- 1/8	-1.6
O	ANDERSON JACOBSON	2- 4	3	0	0.0
O	BEEHIVE MEDICAL ELEC	5- 6	8 1/4	+ 1/8	+2.0
A	BOLT,BERANEK & NEW	7- 10	8 1/4	+ 1/8	+1.5
N	BUNKER-RAMO	5- 7	5 7/8	+ 1/4	+4.4
A	CALCOMP	4- 7	4 1/2	+ 1/4	+5.8
O	CAMBRIDGE MEMORIES	2- 6	5 1/4	+ 1/2	+10.1
N	CENTRONICS DATA COMP	20- 38	28 5/8	1	-3.3
C	CODEX CORP	22- 42	55 1/2	- 1/2	-1.3
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 5/8	C	0.0
C	COMPUTEK CONSOLES	4- 7	8 1/2	+ 1/4	+4.0
A	COMPUTER EQUIPMENT	1- 3	2	+ 1/8	+6.8
O	COMPUTEK TRANSCEIVEK	1- 5	1 1/4	0	0.0
C	CONTEK	4- 9	6 7/8	0	0.0
N	CONRAC CORP	20- 25	21 3/8	+ 3/8	+1.7
O	DATA ACCESS SYSTEMS	1- 3	3 3/4	0	0.0
O	DATA 100	7- 13	10 3/8	+ 5/8	+8.4
A	DATA PRODUCTS CORP	5- 11	9 1/4	+ 5/8	+7.2
C	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC	1- 2	2	+ 1/4	+14.2
O	DECISION DATA COMPUT	1- 4	1 5/4	+ 1/4	+18.8
O	DELTA DATA SYSTEMS	1- 1	1/2	+ 1/8	+33.5
N	ELECTRONIC M & M	1- 3	2 1/2	+ 1/8	+5.2
O	FABRI-TEK	1- 1	3/4	- 1/8	-14.2
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 7/8	+ 1/8	+1.2
N	HARRIS CORP	24- 48	44 7/8	- 3/8	-0.8
A	INCOTERM CORP	9- 20	10 1/4	-1 5/8	-11.8
O	INFOREX INC	3- 7	4 1/2	+ 1/8	+2.8
O	INFORMATION INTL INC	10- 18	14 1/2	- 3/8	-2.5
O	INTEL CORP	88-109	69	- 1/2	-0.7
A	LUNDY ELECTRONICS	4- 7	4 5/8	- 1/8	-2.8
O	MSI DATA CORP	3- 7	5 5/8	- 1/8	-2.1
A	MILGO ELECTRONICS	15- 20	19 7/8	+1 3/4	+9.6
A	MOHAWK DATA SCI	3- 7	8	+ 1/4	+4.3
O	PENRIL CORP	1- 3	2 1/8	- 5/8	-15.0
A	PERTEC CORP	3- 8	5	0	0.0
A	POTTER INSTRUMENT	2- 2	1 5/4	0	0.0
C	PRECISION INST.	7- 10	4 1/2	-1	-18.1
O	QUANTOR CORP	4- 5	4 1/8	0	0.0
O	RECOGNITION EQUIP	8- 11	8 7/8	- 1/4	-2.7
N	SANDERS ASSOCIATES	6- 11	5 1/4	+ 1/8	+1.3
C	SCAN DATA	2- 4	2 5/8	- 1/4	-9.5
O	STORAGE TECHNOLOGY	9- 15	11 5/4	+ 1/8	+1.0
C	T BAR INC	6- 1C	8 1/8	- 1/8	-2.0
O	TALLY CORP.	4- 8	5	- 1/8	-2.4
C	TEC INC	3- 5	4	- 1/4	-5.8
N	TEKTRONIX INC	45- 83	59 5/8	+ 3/P	+0.8
N	TELEX	2- 5	4	+ 1/2	+14.2
C	WANGCO INC	11- 22	18 7/8	- 1/8	-0.8
O	WILTEK INC	2- 2	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1978 RANGE 111	CLOSE JUNE 2 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	2 1/2	- 1/2	-18.6
O	BALTIMORE BUS FORMS	4- 5	4	- 1/4	-5.8
A	BARRY WRIGHT	6- 10	8 1/8	+ 1/8	+1.5
O	CYBERMATICS INC	1- 1	3/4	0	0.0
A	DATA DOCUMENTS	25- 42	55 1/4	- 1/4	-0.7
O	DUPLEX PRODUCTS INC	17- 24	18 5/4	- 1/4	-1.4
N	ENNIS BUS. FORMS	6- 8	7	+ 1/8	+1.8
C	GRAHAM MAGNETICS	9- 13	8 3/4	-1 1/4	-12.5
O	GRAPHIC CONTROLS	13- 19	14 1/2	0	0.0
N	3M COMPANY	55- 65	55	-1 1/2	-2.8
C	MOORE CORP LTD	42- 51	44	+1 1/4	+2.9
N	NASHUA CORP	11- 17	16	- 1/4	-1.5
O	STANDARD REGISTER	18- 19	18 1/2	0	0.0
O	TAB PRODUCTS CO	5- 8	7 1/2	0	0.0
N	UARCO	21- 25	20 3/4	-2 1/4	-9.7
O	VANIER GRAPHICS CORP	5- 8	6 5/8	+ 1/8	+1.9
A	WABASH MAGNETICS	4- 8	8 1/8	0	0.0
N	WALLACE BUS FORMS	19- 25	21	- 1/2	-2.3

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NEWSPAPER

The Big Top Takes Over The Big Apple

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – The National Computer Conference rolled through here last week complete with circuses, calliopes, card sharks and horse-drawn cabs.

Users and industry people – 34,000 in all – showed up for the three-ring affair which featured a ringmaster, technical sessions covering all phases of the trade and the largest exhibition since the industry's golden days of 1969.

They came from all corners of the U.S., Europe and Asia. One attendee even rode a bike from New Hampshire.

The exhibit hall in this hot and muggy city reverberated with the clacking of printers, which seemed to be everywhere on the three floors of the Coliseum.

(Continued on Page 8)

CW Photo by A. Dooley

"Ladies and Gentlemen, Girls and Boys:" Data General's Ringmaster welcomes NCC Visitors.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.

Price: $15/year June 14, 1976 Vol. X, No. 24

NCC '76 Speakers Stress DP Responsibilities

Dynamic Growth Seen Continuing

By Nancy French
Of the CW Staff

NEW YORK – If aviation had evolved at the speed computers have, Neil Armstrong – or his father – would have walked on the moon less than a year after the Wright brothers took off from Kitty Hawk, J. Paul Lyet, Univac chairman and chief executive officer, said here last week.

Addressing the keynote session of the National Computer Conference (NCC), Lyet said the user who spent $42 for 5 million computations in three minutes in the early 1950s today spends less than half a cent for the same answers in 1/80th of a second.

In the 25 years that have passed since the first commercial computer was shipped to a customer, the computer has touched more lives and more institutions than any other invention. "The science fiction of 1951 is today a part of everyday life, no longer a costly convenience, but a necessity," he said.

As for the next 25 years, Lyet sees still more growth. The 1.3 million computer terminals in use in the U.S. will explode to 8 million, he predicted, and "the com-

(Continued on Page 2)

Societies Called 'Sleek and Fat'

By Edith Holmes
Of the CW Staff

NEW YORK – "Sleek and fat," computer practitioners and their professional societies have not assumed the responsibilities to society at large that go along with the increasing importance of computing, according to Anthony Ralston, outgoing president of the American Federation of Information Processing Societies (Afips) and professor of computer science at the State University of New York at Buffalo.

Addressing a plenary session entitled "The Computer Profession" at the National Computer Conference (NCC) here last week, Ralston urged computing's professional societies and their members to go beyond purely technical questions and problems.

For example, they could provide nonpartisan technical assistance in legal struggles – in particular to the judge hearing the U.S. government's antitrust action agasint IBM.

Afips' 15 constituent societies should also continue talking about and publishing professional codes of ethics, he said, but they should stop their efforts to enforce these. Trying to enforce such codes won't accomplish anything, Ralston argued, when the real determiner of ethical standards is society at large.

Finally, professional societies and individual practitioners of computing should promote scientific freedom generally and in the USSR particularly by refusing to support and attend conferences held in countries where science is controlled by politics, Ralston said.

"We in computing are lagging seriously behind our colleagues in other scientific areas" in taking stands beyond technical matters, he said. "We are untroubled by the recent recession and look forward to the future growth of our industry – just look at the exhihits over in the [New York] Coliseum," he added.

Scientific Aristocrats

"We in computing are the aristocracy of science and technology today," according to Ralston, who likened the profession's position to that of physics right after World War II. "But we aren't discussing the interfaces between the profession and society at large as much as we should be at conferences like this."

Taking issues "that are only partly technical and so not easily debugged" as his

(Continued on Page 8)

Product Parade Greets Exhibit Visitors

• Minicomputers

By Esther Surden
Of the CW Staff

NEW YORK – Small business systems based on already introduced processors led the list of minicomputer systems announced at NCC this time around.

Showgoers here last week also met another member of an existing processor family, saw a computer on a board from a major mini maker and were teased by a hint of a small business system that should be available next year.

One of the systems based on an already introduced CPU was Microdata Corp.'s Express family of OEM systems for distributed processing applications. The Express line features microprogramming and stack architecture, a spokesman said.

Languages available on the system, which utilizes the firm's 32S processor, include Fortran IV, Cobol, Basic and Microdata's Express Programming Lan-

(Continued on Page 4)

• Communications

By Ronald A. Frank
And John P. Hebert
Of the CW Staff

NEW YORK – Data communications users found a liberal sprinkling of products and services at NCC here last week.

AT&T had an on-line demonstration of its proposed Dataphone Switched Digital Service (DSDS) now pending before the Federal Communications Commission (FCC). Using the 821A manual call controller with Switched Digital Service Units, Ascii messages were transmitted at 56 kbit/sec to a DSDS switch at an AT&T central office in New York. From there messages were switched to a Digital Equipment Corp. PDP-9 at Bell Laboratories, in Holmdel, N.J.

Responses were displayed on a Video Systems Corp. CRT in the AT&T booth on the exhibition floor. Inquiries transmitted to the PDP-9 were answered on

(Continued on Page 4)

• Systems

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – New products for the large systems user were few and far between here last week as introductions became almost the exclusive preserve of the mini and communications equipment vendors at NCC.

The traditional plug-compatible peripherals makers were well represented on the floor, but few new products were in evidence. The mainframers were represented by IBM, Burroughs Corp., Control Data Corp. and Univac; however, the only new mainframe to bow at the conference was the Univac 90/80 [CW, June 7].

The major action for the larger shops occurred at both ends of the DP spectrum – data entry and output, particularly printers.

One firm – Sycor, Inc, – combined both of these trends by adding a printer

(Continued on Page 4)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160. ac

Ink Jet Printer Also Bows

IBM System 32 Gets Word Processing

By Ronald A. Frank
Of the CW Staff

NEW YORK – IBM added word processing capabilities to its System 32 along with an ink jet printer during NCC last week, but none of the products were shown on the exhibit floor.

Using a program product called Word Processor 32, the company added features that allow the desk-size CPU to automatically generate, revise and format documents.

The program is implemented with the 5321 magnetic card unit allowing the 32 to accept inputs from IBM magnetic card typewriters, the company said. Word processing enhancements also include an upgraded System Control Program which features upper- and lower-case and half-space printing; plus upper- and lower-case keyboard/display capabilities.

CW At NCC

As part of the System 32 introduction, IBM also added its first ink jet printer which operates at 92 char./sec and has automatic paper handling, magnetic card input, formatting capabilities and optional communications capabilities.

Called the 46/40 document printer, the unit includes an automatic envelope sheet feed mechanism and magnetic card read capability. Information recorded on magnetic cards can be transmitted from one 46/40 to another or to a CPU at speeds ranging from 600- to 2,400 bit/sec in Ebcdic; Ascii; or Texcode, used by IBM magnetic card typewriters.

The 46/40 includes a 6,600-character text buffer and it has an internal stored program contained in read-only storage modules that are said to require no program loading.

The 46/40 costs $760/mo or $29,000. The communications feature costs $135/mo or about $5,500. First deliveries are scheduled for October.

The 5321 magnetic card unit will be available in November for $10,200 or $255/mo. The enhanced System Control Program is available free. The upper- and lower-case printing and keyboard/display features are $170/mo and $25/mo respectively. All of the 32 enhancements are also available under various IBM lease plans.

Growth Predicted to Continue

(Continued from Page 1)

puter, through terminals, will be as much a part of the office as today's typewriter."

Today's frustrations in every part of our society will be tomorrow's computer applications, he said, adding that today computer systems are being used in only about 10% of the potential applications.

Today, computer communications services used by the general public are a $100 million market. In another 10 years or so, that market will have exploded 100-fold to $10 billion. By 1990, it will double to $20 billion.

It is not the opportunities for exciting new growth, however, but the constraints that Lyet said concerned him.

Communication is one of those constraints, he said. "If computers are to be the important part of the future society I described, we have got to bring the public into the act," he said.

DPers should help eliminate the mystique, the acronyms, the buzzwords – to find better and clearer ways to communicate the benefits of the computer to potential, nontechnical users, who represent the largest-yet untapped market.

"The constraint to future industry growth which worries me the most is people," he said. Some are working so hard solving today's very demanding problems they fail to address the even larger and more complex technical challenges of tomorrow.

"What we have seen in the past 25 years has not been computer progress, but rather people progress – the sum of individual achievements of the professional men and women who work for the industry," he said.

The industry's growth potential over the next 25 years is dependent upon individuals' investing in themselves by constantly learning and exchanging ideas.

Business constraints are also a concern, Lyet said. Among them he cited present U.S. tax structure that increases rather than eases the difficulty of raising equity capital and European trade barriers that give preferential treatment to domestic companies.

"The computer industry needs about $1 of assets for each $1 of revenue," he said. "That's more than can be generated from computer earnings alone, and borrowing all the rest creates financial imbalance."

Recent efforts by European countries to develop their own computers to the exclusion of U.S. computers constitute competitive restraints, he said. "What started out to be an anti-IBM measure ended up being anti-Burroughs, anti-Honeywell and anti-Univac as well."

Univac has been partly responsible for some protective actions taken by certain foreign countries "through our past refusal to permit local ownership participation, through lack of sensitivity to very real motivations of national pride and status and through a belief that we can remain technologically superior and self-sufficient indefinitely."

Univac has changed its attitude, however, and now has entered into joint ventures in some European countries with considerable success.

Voters' Choice

NEW YORK – Jimmy Carter will stomp for the Democrats next fall as Gerald Ford barnstorms the country to keep his seat in the Oval Office.

At least that's what NCC attendees hope will happen, according to a Presidential preference poll run on the exhibition floor by Bourns Management Systems.

Attendees were given the chance to list their choices on a ballot which was scanned by an optical mark reader for input to a CPU. At mid-week the results closely paralleled those of the last primary contests, which were held during the show.

In the Democratic race for the nomination, Carter led with 396 votes, Sen. Hubert H. Humphrey was next with 86 and California Gov. Edmund G. Brown came in third with 79.

Ford, with 433 votes, swamped Ronald Reagan's 138 votes to grab the Republican nomination.

In the area of campaign issues, attendees said the economy is the most important issue, with honest politics running a close second.

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Decisions

"Okay, Whitlow, you've marketed 1,000 SyncSorts. Now would you like to try for 2,000?"

(Sure. If IBM keeps making hardware, how can we miss?)

Call (201) 568-9700

If the question is sorting, the answer is SyncSort.

OVERSEAS REPRESENTATIVES —

London, Paris, Dusseldorf, Brussels — (Gemini Computer Systems), Rijswijk (ZH) — (PANDATA), Madrid — (Entel/Ibermatica), Vienna — (Ratio), Sao Paulo — (Deltacom Do Brasil), Melbourne — (The Shell Company of Australia, Limited).

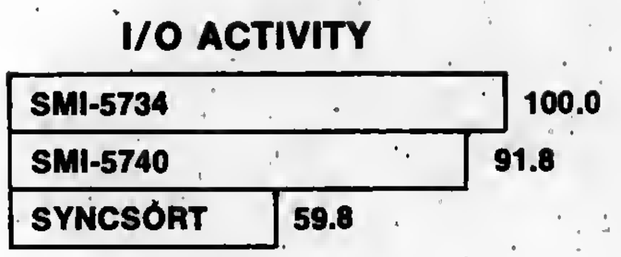
Sometimes we almost feel like Archimedes. It's as though we've discovered a natural law of our own.

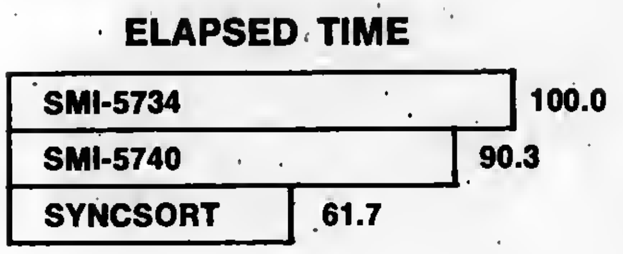
Even the Ph.D.'s around our place regard our discovery with a certain amount of awe. They refer to it, in hushed tones, as the "SyncSort Factor."

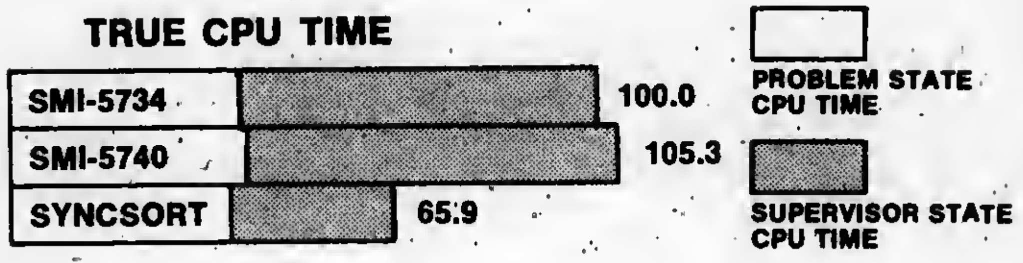
It's a progression that goes something like this:

1. IBM will continue to make and market computers. (That seems like a safe $2 bet.)
2. The busy people who use these computers will naturally require the best sort package they can obtain. (Sorting is the most frequent job on any commercial computer.)
3. These people — being intelligent men and women — will sooner or later find their way to SyncSort III-and-a-half. (It's the best sort package on the market.)
4. None of the foregoing will harm our business. (We will continue to update our package so that it will always stay ahead of the competition.)
5. This will lead to more sales and more improvements. (Maybe we should call our discovery the "Law of Perpetual Sorting Improvement!")

If you'd like a graphic representation of the "SyncSort Factor" take a look at the picture below. These graphs depict what happens when you match SyncSort III-and-a half against other sorts on the market today:







Performance is, of course, the bottom line in sorting. But it's not the only thing you should consider in choosing a sort package. Is the sort versatile, for example? Will it support 3350 devices in their native mode without having to sysgen a new system? SyncSort III-and-a-half *will*.

And how's the sort support? Will anybody help you phase the package in when you start using it? If you call the other supplier with a tricky little question, will there be anybody there willing to take the time and effort to give you a reasonable answer?

We will. In fact, we *like* receiving questions from users. It's a hangover from the days when we were pioneering all those developments that opened up the sorting industry. Once an explorer, always an explorer!

The foregoing are some reasons why SyncSort has been so successful in penetrating its market. (In fact, we think we may have obtained a bigger slice of our market than any other software product.)

So we don't see 2,000 users as an impossible goal. Not unless nature repeals the "SF." Or IBM goes out of business.

WHITLOW
COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Many Minis Introduced at NCC Based on Older CPUs

(Continued from Page 1)

guage, which is based on PL/I.

The system can accommodate up to 512K words of main memory in 32K-word increments. Writable control memory and floating point are optional.

The Express I includes a CPU with 32K words of memory, a 10M-byte disk system, a tape cartridge system also introduced here, a console display and a line printer interface for medium- to low-speed printers.

The system can support up to eight users with interactive or batch processing and can be expanded to include additional disk storage to 50M bytes, one more tape cartridge drive, a card reader and an additional 32K words of memory.

Express I costs $19,950 in single quantities and is discountable to 25%.

The Express II comes with either cartridge tape or IBM-compatible magnetic tape systems. A basic system package includes a 32K CPU, 50M-byte disk drive, tape cartridge system with two drives, console CRT and 120 line/min printer.

The Express II costs $27,650 in large quantities. Microdata is at 17481 Red Hill Ave., Irvine, Calif. 92714.

The Power series of small business systems from Digital Computer Controls, Inc. is based on that firm's existing minicomputers.

The 1000 series with 24K of memory, 256K-word dual floppy disk system CRT, 100 char./sec printer, desk enclosure and the firm's Extended Operating System sells for under $16,000.

The 2000 contains all features of the 1000 but adds 2.5M bytes of disk and a 330 char./sec printer. Based on the firm's Mod Five, it costs under $24,000.

The 3000, based on the 616 mini, has 5M bytes of disk and a 330 char./sec printer and costs $32,000.

The systems are geared to both end users and OEMs, DCC said. The firm is at 12 Industrial Road, Fairfield, N.J. 07006.

Four-Phase Systems, Inc. brought a 24-station, Cobol-programmed distributed processing system to NCC.

The IV/50 was designed for remote use with the firm's family of Network Transaction Processing software products. It supports 24 CRTs.

A typical IV/50 with 12 CRTs, 72K CPU, decimal arithmetic, 10M-byte disk, 354K-byte diskette and bisynchronous communications costs $1,335/mo on a 42-month lease including maintenance.

The firm's IV/40 was enhanced to offer a 10M-byte fixed disk. Monthly rental for a IV/40 system with 24K bytes of memory, four displays, 10M bytes of disk, a 354K-byte diskette and IBM 2780/3780 communications is $628 on a 42-month lease including maintenance.

Four-Phase is based at 19333 Vallco Parkway, Cupertino, Calif. 95014.

Modular Computer Systems, Inc. (Modcomp) showed up at NCC with another member for its Modcomp IV family.

The Modcomp IV/35, a 32-bit mini, accommodates 1M byte of memory and 32 direct memory processor I/O channels; it was designed for stand-alone measurement, control and communications real-time tasks, the firm said.

Along with the IV/35 the firm introduced an enhanced version of its Max IV multiprogramming operating system, which it said allows double the virtual memory addressing available on the prior Modcomp IV models.

Eight virtual program environments are controlled by a memory management system which provides high-speed hardware for all memory allocation/deallocation and memory context switching functions, Modcomp said.

A basic Modcomp IV/35 with 32-bit parallel bus, arithmetic unit, 12K-byte memory and memory expansion capability to 1M byte costs $42,500. Modcomp is at 1650 W. McNab Road, Fort Lauderdale, Fla. 33309.

The Hewlett-Packard Co. (HP) 2108K is a microprogrammable processor on a board with 178 instructions.

The board has five times the performance of the Digital Equipment Corp. LSI-11 and was designed for word-processing and controller applications.

The board is available for $1,475 from the firm at 1501 Page Mill Road in Palo Alto, Calif. 94304.

Japan's Nippon Electric Co. Ltd. (NEC) showed its NEAC System 100 which, it said, will be available in the U.S. next year.

The small business system, with 32K bytes of memory, keyboard and display console and disk, costs about $24,000.

The system features Cobol, Fortran and Best, the firm's compiler language. NEC can be reached at 5 Militia Drive, Lexington, Mass. 02173.

Few Products Announced for Large Systems Users

(Continued from Page 1)

the CRT within 64 msec, according to an AT&T spokesman.

Beehive Medical Electronics, Inc., in Salt Lake City, Utah, introduced three terminal products including a remote video display terminal and an intelligent communications terminal.

The top-of-the-line Beehive B800 is said to offer the user full programmability with microprocessor storage capability of up to 32K 16-bit words.

It operates at transmission speeds up to 9,600 bit/sec in half- or full-duplex, asynchronous or synchronous modes. Communications interfaces available include RS-232C, asynchronous, synchronous or bisynchronous, Beehive said.

The B800's processor is a bipolar, 16-bit microprocessor operating in Data General Corp.'s Nova 1200-compatible code, it said.

The B800 carries a basic purchase price of $5,945.

Beehive also introduced the B500 and B100 communications terminals.

The B500 is also a microprocessor-based programmable terminal with 4K random-access memory (RAM) for the display and up to 4K programmable read-only memory (Prom), 8K of read-only memory (ROM) and up to 48K of RAM in the terminal program, the company said.

It features a down-load capability from the CPU, which is said to protect against memory loss; data transmission rates up to 19.2 kbit/sec; and full- or half-duplex on-line operation.

The B100 is designed as a self-contained remote video display terminal with switch-selectable transmission rates from 110- to 19.2 kbit/sec, Beehive said.

The terminal features cursor control, RS-232C or current loop interface and hard-copy capability with a printer interface. It employes a 12-in. CRT monitor which is formatted to display 12 lines or an optional 24 lines with 80 char./line; upper- and lower-case characters are optional, the company added.

The B500 is priced at $2,695 and the B100 remote display terminal costs $1,495.

Telenet Demonstrated

In one of the largest demonstrations to date of a packet-switched network, 16 firms were connected to the Telenet Communications Corp. network at the show. Academic, governmental and commercial time-sharing organizations provided terminal access to applications ranging from APL and economic forecasting to computer teleconferencing.

Attendees at the conference were able to use a variety of terminals to access 75 host CPUs that were operating at various DP centers around the country. In addition to the conventional CRTs, and other terminals, the New Jersey Institute of Technology showed an entry device which allows handicapped persons to enter data into a CPU using alternative methods such as touch and sound.

Interactive terminals provided by each organization in the demonstration were connected to a Telenet Access Controller (TAC) at the exhibition. The TAC was connected to the Telenet network which in turn provided interconnections to the individual participating networks.

Communications Offerings Sprinkled Liberally

(Continued from Page 1)

to its 350 data entry system to come up with the 351, an intelligent data entry system with 16K bytes of memory, 500,000 characters of diskette storage and either 60-, 120- or 180 char./sec printers, and a 300 line/min printer.

The 351-1 with a 60 char./sec printer rents for $400/mo on a one-year lease and sells for $16,100, while the unit with the 300 line/min printer rents for $715/mo on a one-year lease and sells for $26,800.

The Ann Arbor, Mich., firm expanded its 400 line with a Model 410, which is a single display station with 2.5M characters of fixed disk and a 60 char./sec printer for $516/mo on a three-year lease.

In other data entry action, Data 100 Corp. in Minneapolis, Minn., showed its Model 74-107 key-to-diskette version of its Keybatch data entry system.

The system can have one or two local keystations and up to three diskettes of 242K characters each plus a range of card readers and line printers and communications capability. The unit is priced at $370/mo on a five-year deal and carries a purchase price tag of $15,456.

Data 100 also added a 600 line/min printer with a removable character clip/cartridge. The 5560 with 132-column print line and 64-character Ascii font is priced at $8,900 on a purchase deal.

A plug-compatible replacement for the IBM 3741 key-to-diskette unit was announced by General Systems International in Anaheim, Calif. The GSI-741 uses biploar logic and comes with one entry keyboard, a CRT display and one or two flexible disk drives.

The unit has bisynchronous communications capability, and an optional hard-copy printer is available. The unit is offered primarily to OEMs at prices that are said to be 60% less than the equivalent IBM prices.

Motiograph, Inc. in Garland, Texas, made the first general showing of its Accurascan optical mark reader for the general-purpose computer user although the firm has been selling units to restaurants for over five years.

In the printer area, Potter Instruments Co., Inc. in Plainview, N.Y., introduced the LP7000 that is plug-compatible with the IBM 1403 and offers chain print speed from 1,240- to 1,500 line/min using a 48-character set and 132 columns. It is also available with 64-, 96- or 128-character sets, which are Ascii- or Ebcdic-coded, numeric, alphanumeric or symbolic and costs $21,855 and $31,340 with controller, the firm said.

The firm also exhibited a 500 line/min unit designated the LP6351 which is said to deliver 1,100 char./sec and has a reduced print size option. The unit, priced at $5,800, generated the standard 64-character font in a 9 by 7 matrix pattern and features a built-in microprocessor that uses special character set generation.

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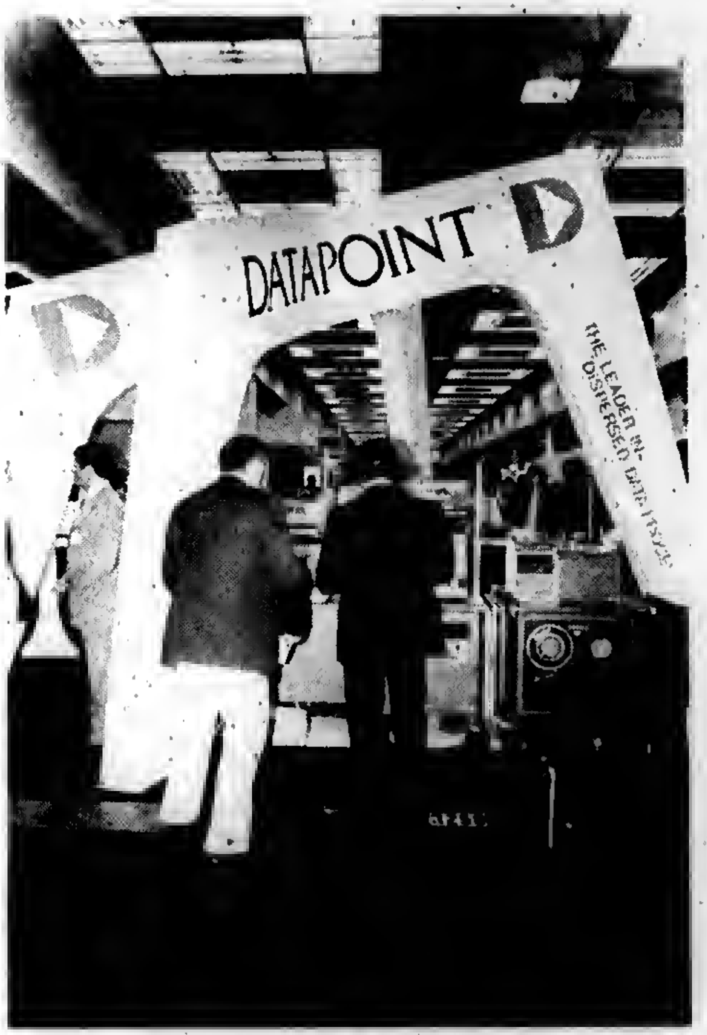
Child's Version of Mom and the CPU

Shoe leather took a beating on the floor.

Tomorrow's experts were hard at work.

UNDER THE NCC BIG TOP

CW Photo Feature
By Ann Dooley
And Ron Frank



Under the Datapoint Arches

Birds-Eye View of CDC Booth

"Interpretation" of APL Characters

Explaining Computek Nitty Gritty

Univac told users about the 90/80.

Some wheelers and dealers were outside.

Show business was back with a crack.

Show visitors got all the angles.

Prime patterns were prevalent.

Behind the Scenes at IBM Booth

Panorama by R. Frank, H. Fling, A. Doolay

Societies Chastised for Ignoring Responsibilities

(Continued from Page 1)

subject, Ralston proposed the technical expertise of Afips is not being brought to bear in U.S. vs. IBM.

The Afips president said he made no claim to understand the legal issues involved in the antitrust suit and its trial, but wondered whethet Judge David N. Edelstein, who is hearing the case without a jury, really has the technical information he needs to decide a case with such momentous implications.

Afips and its member societies put together a senior group of nonpartisan scientists and technologists to advise Edelstein on technical matters either by order of the court or as a friend of the court.

Friends and colleagues scoffed at his naiveté, however, Ralston added, suggesting that competent, nonpartisan comment is not possible in an adversary system like the law.

Nonetheless, by being suhpoenaed to appear in court and testify on behalf of one side or the other in a trial, computer scientists and practitioners lose any aura of objectivity, even though they may well be objective. Arguing that this hardly seems the best means of obtaining "the best evidence," Ralston proposed the establishment of a science court or board to advise judges in trials like U.S. vs. IBM and regulatory agencies like the Federal Communications Commission.

Unenforced Ethics

On the topic of professional ethics, the outgoing president noted the publication of codes of behavior by societies like the Data Processing Management Association (DPMA), the Association for Computing Machinery (ACM) and the British Computer Society, but added these are virtually unenforced in the U.S.

The publication of codes and the reading of them by many have promoted an understanding about the need for ethics and ethical behavior in the profession, he said. But Ralston is "strongly opposed to enforced codes of ethics," he said.

Their enforcement is subjective, a matter of judgment by individuals, he said. In addition, the only sanction against unethical behavior at present is expulsion from the society whose codes have been violated.

Even if codes are enforced, they don't necessarily foster more ethical behavior by practitioners of a profession, he added, citing law and medicine as older professions with well-established codes and frequent violations nonetheless.

Watergate showed us lawyers are disbarred only after they have committed a crime, and current debates on malpractice revolve around insurance costs rather than how to prevent such suits from arising in the first place, Ralston said.

Broad education in the arts and sciences in addition to training in one's craft is perhaps the best and the only way to teach ethics, he said.

Professional computing societies should take a firmer political stand on the need for a separation between politics and science, Ralston said.

"Certainly issues political, social or otherwise without a computing component are just not fit fare for the comments of professional societies," he said.

At the same time, he argued societies have a right and an obligation to comment on any issue that involves their profession. In particular, scientific freedom – the ability of scientists to carry on the pursuits of their trade without government intervention – is a legitimate subject for professional societies to comment on, Ralston said.

While scientific freedom is not a particular problem in the U.S., he noted such freedom has been lacking abroad – notably in the USSR.

Next to food, however, technology is perhaps the most important commodity in the world today, he suggested. And as the aristocrats of science and technology, that gives computer practitioners and their professional societies enough leverage to be effective when countries like the USSR restrict the rights of a scientist to attend a scientific conference.

The Afips president urged American professional societies not to sponsor or participate in conferences held in countries where a commitment to scientific freedom has not been made.

Big Top Takes Over Big Apple for NCC

(Continued from Page 1)

Where the printers didn't ring out, minicomputers, all types of disks and terminal equipment dominated.

While those products were the most prolific, all segments of the industry were represented and exhibitors ranged from the largest of mainframers to the smallest of OEM start-up operations. All reflected the spirit of optimism that seems to be pervading the industry and appeared as happy as a six-year-old clutching a whirl of cotton candy and watching the clowns come out for the parade under the Big Top.

The generally well-attended technical program rounded out the show with what most agreed was the best set of sessions and papers in years. And even the long walks between sessions and exhibit centers failed to deter most session attendees from getting their fill of technical details, nostalgia or social concerns.

The special sessions lived up to their names this year with the best student computer fair yet providing one of the highlights of the sideshows – a well-planned and interesting program rather than an afterthought, as it has been so often in the past. And the computer art exhibit was spiced with a silent auction and well-arranged showing.

The tents have been struck and the show has moved on, but the memories will linger until the Big Top rolls around once again next year in Dallas on June 13-16.

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Why three monitors? No one monitor can serve all users without being grossly wasteful for some, while being significantly inadequate for others. Obviously, the user with a few terminals performing simple inquiries requires facilities different from the user with hundreds of terminals performing complicated on-line updating with a data base manager. Customizing a "do everything" monitor simply cannot produce an optimal system. That is why we offer three monitors. Each of our monitors is uniquely suited to – specifically designed for – a particular environment. Each the best!

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- Each of our monitors has special features designed for your environment, and that makes them unique from other systems. These unique capabilities make our systems clearly superior.
- Our monitors have been frequently chosen to replace installed systems using other monitors.
- We provide the best possible DB/DC environment. We offer integrated support for ADABAS, IDMS, Model 204, DL/1, TOTAL System 2000, CFMS, AMIGOS, as well as an interface package for user-written or other data bases.
- Informatics offers a complete array of product support services from offices around the country and around the world. Our support includes extensive documentation, professional instruction, videotape courses, highly capable specialist system engineers and over 1800 data-processing professionals available for any systems and programming service.
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DP Veterans Gather

Eniac 'Looked Logical' to Developers

By Molly Upton
Of the CW Staff

NEW YORK – There was a "psychological buildup [at the Moore School of Engineering] to the point where Eniac looked like a logical advance," John G. Brainerd, former supervisor of the Eniac project, recalled at an NCC session here last week.

"Origins of Eniac," attended by at least 10 veterans of the project, including four women, afforded insight into the behind-the-scenes chain of events which led to the contract award for the construction of the first election computer.

The group at Moore was "ready to at least consider far-out things," Brainerd said, noting there were several factors which, combined, were key to the birth of Eniac at Moore.

Had one of these factors been lacking, he added, the event might not have happened.

Joining Brainerd in his reminiscenses were Herman Goldstine, then the liaison officer with the Ballistics Research Laboratory, and Irven Travis, retired vice-president of research for Burroughs and formerly a professor at the Moore School.

By 1934, the analyzers were up and running.

In explaining the evolution of the Eniac project, Brainerd said it was important to note the group at Moore accumulated experience in obtaining and administering government contracts in an era when government contracts to universities were very rare.

Most universities had no experience administering the contracts, faculty had little or no experience in an R&D environment under contract conditions and some universities were opposed to government contracts, he said.

The Moore group had accumulated experience with large machines through its work on a differential analyzer and Brainerd's involvement with a network analyzer, he said.

Mauchly in Action

The idea of an electronic computer for ballistics control "got thrown around without much action" until John Mauchly appeared on the scene and wrote a memo which got the ball rolling, Brainerd said.

In order to perform the needed calculations for ballistics information, there were about 150 "human computers" who worked six days a week on a Ballistics Research Laboratory project conducted at Moore.

Most of these were women with mathematical backgrounds. But "we kept running out of women," Brainerd said, because they would move when their husbands were transferred, so Moore set up a training facility.

Approval of the Eniac project from the university took some arguing, Brainerd observed, but after only a week the provost was convinced the project should proceed.

In March 1943, Mauchly's proposal was shown to Goldstine, whom Brainerd described as having the ability to get what he wanted.

In April, accompanied by Mauchly and J. Presper Eckert, Brainerd went to discuss the project with the Ballistic Research Lab's Aberdeen group.

Approval was granted, largely because of Oswald Veblen, Goldstine said. The proposal was then circulated for comments.

All of the comments were negative, Brainerd added.

At the beginning of the project, the overriding concern was to make the machine function; programming took second place, Brainerd said.

Eniac was intended as a special-purpose machine to construct firing tables, but it was general-purpose by virtue of its capability to integrate differential equations and then inverse interpolate and other steps, he said.

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While the notion of flexibility was secondary at the beginning of the project, toward the end a group of the women "human computers" constituted the programming section.

All realized the Eniac would be a reality, and the software aspects loomed larger, Goldstine said.

As an example of what the programming group did, the first problem run on the Eniac was not for Aberdeen but for Los Alamos, he said.

With 15,000 vacuum tubes, Eniac was not given a larger mean time between failure by skeptics. In fact, some estimates indicated a problem would take 10 minutes to solve and the average mean time between failures would be 10 minutes.

However, after running the Los Alamos exercise, Eniac was up for "hours" at a time, according to members of the audience. The memory capacity was 20 accumulators or about 200 words, some veterans indicated.

After the war, Moore was asked to build a second Eniac. The request came from the Russian government, Brainerd said.

CW Photo by A. Dooley

Talking It Over

NCC attendees compare notes in one of the few lounge areas on the convention floor.

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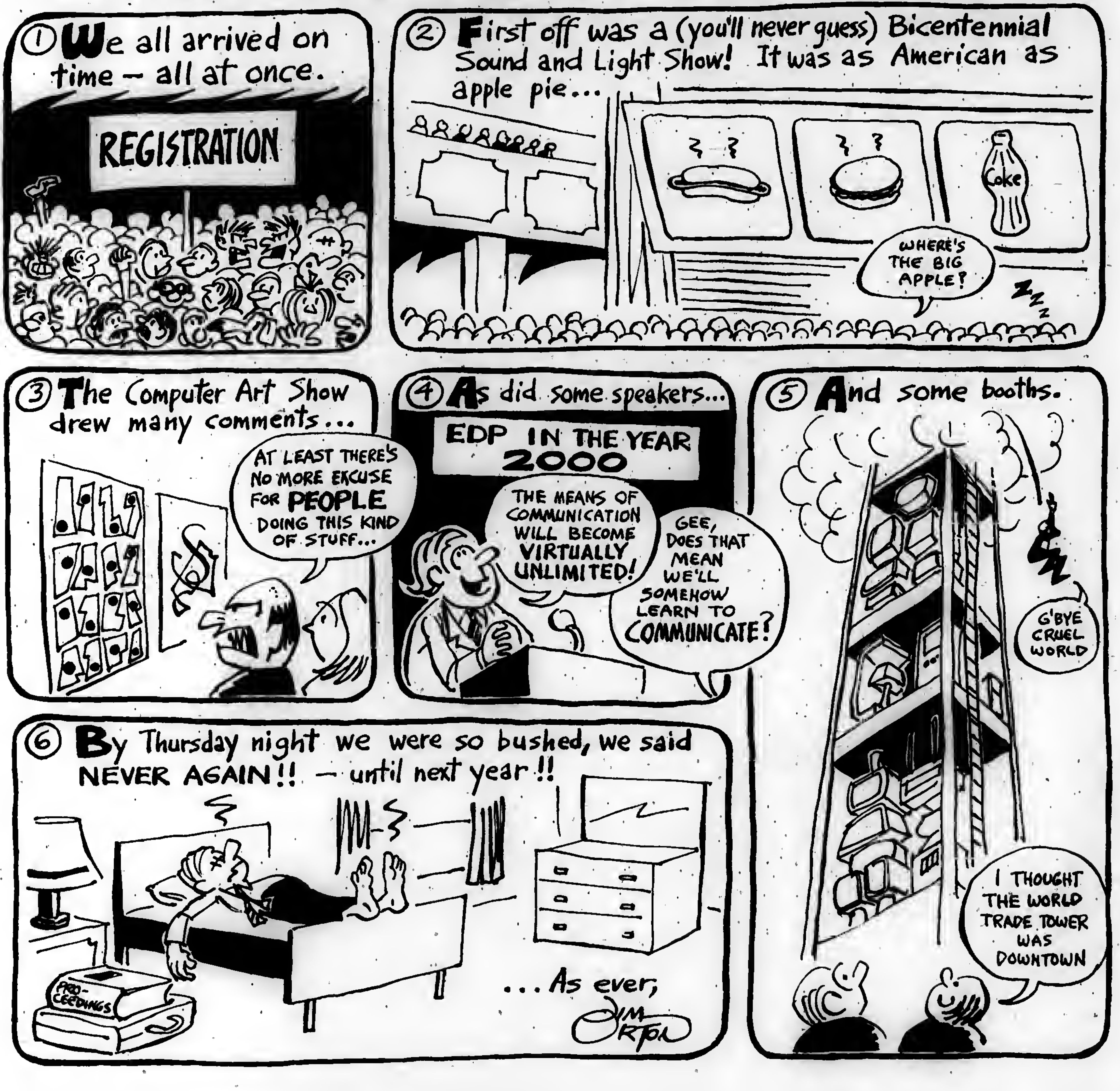
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Fewer People Feeling Threatened by DP, Survey Finds

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Members of the general public feel slightly less threatened by computers today than they did five years ago, David Ahl, editor of *Creative Computing*, reported at NCC here last week.

A recent survey taken by that publication showed 37% of the adult respondents and 40% of those under 21 today feel computers dehumanize society by treating everyone as a number – a decline from the time five years ago when *Time* magazine asked the same question of the general public in a survey done in conjunction with the American Federation of Information Processing Societies (Afips).

At the same time, 87% of the adults and 84% of the youths surveyed feel computers are having a dramatic effect on the quality of life, Ahl reported.

Split Over Issues

But the two groups were split over the issues of whether computers will be used to improve the quality of law enforcement and health care. Of those surveyed, 82% of the adults said they feel computers would improve police work, while only 70% of those under 21 expressed the same feeling; 79% of the adults but only 54% of the youth category saw computers improving health care.

In addition, there appeared to be a greater awareness of the problems of data banks and privacy today compared with five years ago, Ahl noted. His survey showed 64% of both categories believe credit checks are a worthwhile use for computers.

The earlier *Time*/Afips study had showed a higher percentage who felt this a good practice, he said.

The two categories were also split over the question of whether it is possible to escape the influence of computers, Ahl reported, with the youth category feeling more often it is possible.

Overall, 92% of the adults agreed with the idea that a person cannot escape from the influence of computers, but only 67% of those under 21 agreed with that statement.

Young people appeared to be better acquainted with the more interesting uses of computers. Eight percent of the adults surveyed agreed computers are best suited for monotonous, repetitive tasks, while only 57% of the other group concurred with that statement.

Most people do view the computer as a tool, Ahl reported, noting 73% of the adults and 61% of the youths said the computer is just a tool like a hammer or lathe.

Surprisingly, however, one-fifth of those surveyed did not feel computers speed up business operations, but rather slow down and complicate simple business operations, he said.

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There was disagreement between the two groups on whether computers will create as many jobs as they eliminate, with those under 21 far more skeptical than the other group.

While 63% of the adults agreed computers would create as many jobs as are lost, only 40% of the under-21 group agreed and a full 29% disagreed with the statement.

Computers are still held in awe by many in the general public, the survey showed, with 25% of the adults and 31% of the under-21 group agreeing with the statement that computers are beyond the understanding of the common person, Ahl said.

In all, 10% of both groups said computers make mistakes 10% of the time, Ahl reported, while 67% of the adults and 72% of those under 21 agreed with the statement that programmers and operators make mistakes while computers operate almost without error.

The adults were more positive about the possible technical solutions to the problems of privacy, the survey showed, with 60% of the adults agreeing it is possible to design a system which protects the privacy of data, compared with only 49% of the under-21 group agreeing with that statement.

Accessible DP Power Results Unknown

By a CW Staff Writer

NEW YORK – Computer power will soon be as freely accessible as electric power is today, but it is difficult to predict the possible consequences of that accessibility, Sema Marks, an IBM marketing representative, told a session on "Public Attitudes Toward Computers" at NCC here last week.

Access to systems is coming about rapidly, she said, noting some calculators now on the market have the power of an IBM 360/30.

All new technologies bring about problems; Plato worried that the use of writing might make it harder for people to remember, she pointed out.

While reading and writing were once very specialized skills handled by specialists, the printing press developed by Johann Gutenberg changed that, Marks observed.

At the time of that development, it was probably not possible to predict the effect it would have on the general public or how it would revolutionize the world, she noted.

Potential Accessibility Gap

Clearly there will be a growing demand for computer power, Marks said, since many school-age children are now being exposed to systems early in life and have come to view computers as a normal part of their worlds.

They will expect to have access to computers when they enter the business or academic world, she added, and this may lead to a gap between those with access to computer systems and those without access.

The early exposure students are getting to systems has also made them less willing to put up with problems in operating systems or other parts of the systems, she said.

In the future, therefore, systems will have to be developed that adapt to people rather than requiring people to adapt to them, Marks said.

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Foreign Government Backing DP Firms

U.S. Control of DP Called Challenge to Europeans

By Edith Holmes
Of the CW Staff

NEW YORK – There is no question in foreign circles that the U.S. dominates the world computer market, according to an industry analyst speaking at an NCC session here last week.

At the same time, nations like Germany, France, Japan and England have viewed American control as a challenge, and their governments have met that challenge by vigorously supporting their home ventures into mainframes, the associate general counsel for Univac said.

Speaking at the annual conference's session on the world environment for data processing, David K. Anderson agreed with Fred Withington of Arthur D. Little that the U.S. unquestionably has the upper hand in foreign markets, but added that the national interests of these countries may lead them to turn the U.S. challenge around in the long run.

American Success

Withington spoke to the reasons for American success in the computer industry. Defining DP as "general-purpose computer systems primarily," he said. U.S.-based manufacturers won the market, not with their technology or their cost-effective offerings, but by providing users with a total package or range of machines with compatible capabilities and superior performance.

American computer makers have been particularly successful in what Withington identified as the dominant product of DP today – system programs. He suggested the perfection of multipurpose operating systems like IBM's OS and GE's Gcos over the last 20 years is a feat non-U.S. vendors haven't begun to match.

There is a trend among foreign companies to borrow U.S. technology and then expand on it – lately to build their own small machines and minicomputer networks, he said.

But "the name of the game is still general-purpose computer systems and will be for some years," Withington said.

U.S. manufacturers can leave many manufacturing costs behind and court subsidies from foreign governments by transferring all but their top management and research and development activities "offshore," he said. "Then all that's left in the U.S. is the head and neck of the chicken," Withington added, implying there are risks involved in maintaining the rest of the business abroad.

It is the national pride that keeps foreign countries from sitting back and letting "the four or seven crazy American firms in the computer business break ground for the industry in their countries," then taking their technology and revenues away from them and striking off in their own directions, he said.

Anderson argued it is that same "national interest," however, that is helping foreign countries to build their own computer industries in the face of American dominance.

Economic nationalism is on the rise in places like Japan and in Europe, even though much of the impetus for it has politics and prestige as its roots, he said. Computers have become symbols of economic and technical power.

Anderson noted nationalism has also pulled apart Europe's cooperative effort to establish a computer company. Formed in 1973 by CII in France, Siemens in Germany and Philips in England, Unidata was designed to pool the technologies of these companies and their countries and to create the economies of scale necessary to achieve success in the computer systems business, he said.

But by 1975, the unwillingness of Germany and France to give up the national independence of the companies they had involved in the venture led to its breakup. Siemens decided to go it alone with Unidata; France acquired a new partner in Honeywell Bull; and Philips withdrew from mainframe manufacture altogether, Anderson recalled.

Nonetheless, "the European computer community is healthy and has the potential for hurting the U.S. computer industry," he said, pointing out the support individual companies receive from their governments.

Technology Exchange Goal of Licensing

By a CW Staff Writer

NEW YORK – Ultimately, technology is exchanged through international licensing, Maurice A. Longsworth of Honeywell Information Systems told an NCC audience discussing the world environment for data processing here last week.

If those companies that have technology give it to foreign firms, they will effectively provide the less developed companies with the research and development resources they need. In the long run, Longsworth said, the less developed firms will return this aid in the form of their own innovations.

He sees an increasing emphasis on technology transfer between companies and nations in the years ahead.

There is an increased demand for technology in countries that have natural resources to exchange, Longsworth said. Coupled with world economic interdependence and balance of trade problems, the transfer of and licensing of intellectual property is a growing business, he said.

Add to this environment the presence of multinational corporations with their desire to carry products throughout the world, the nationalism of countries and their concern for strategic advantages, and a growing interest in joint ventures becomes a reasonable compromise, Longsworth suggested.

Joint Ventures Prevalent

Licensing was more popular in the past than it is now, he said. Joint ventures have become more prevalent because companies with technology want the continued commitment of foreign firms, and

(Continued on Page 13)

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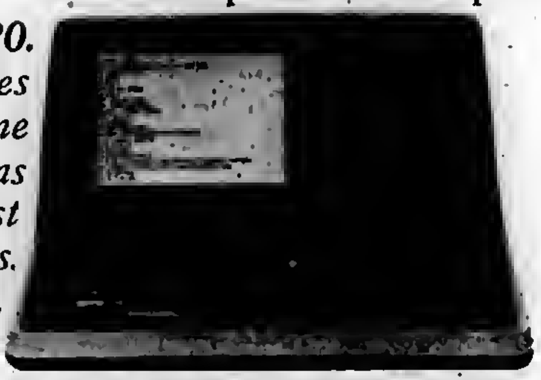

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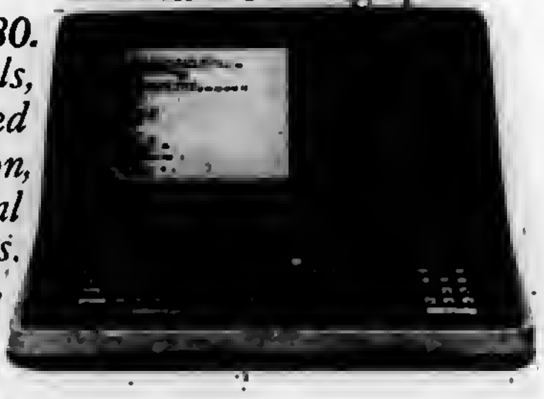

Eastern Bloc CPU Found Twice as Powerful as 370/145

By Toni Wiseman
Of the CW Staff

NEW YORK – The Eastern European-built Ryad ES-1040 processor is about twice as powerful as the IBM 370/145 in scientific and engineering applications and at least equivalent to the 370/145 in business applications, Robert A. Koenig told NCC attendees at a session here on computing in Europe.

Koenig is a principal consultant of systems strategy for Control Data Corp. In 1975 CDC purchased an ES-1040 for testing and evaluation.

Basic findings were that the ES-1040 is compatible with the IBM 360 instruction set, he said. The processor technology, using TTL integrated circuits, lags the U.S. by three years, the core memory shows a lag of about eight years, while peripherals are eight to 10 years behind the U.S., he said.

The Ryad family consists of six processors, numbered from 1010 to 1060, and a complement of peripheral equipment developed by Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland and the USSR.

The system CDC purchased consisted of the CPU, an operator console, a main memory of 256K bytes, a byte multiplexer channel and one selector channel, Koenig said.

The peripherals included a card reader, card punch, line printer, two 7.25M-byte disk drives and two 79 in./sec tape drives.

To test the Ryad system's compatibility with the IBM 360 instruction set, CDC ran a set of jobs from the Service Bureau Co. (SBC), he said. The SBC personnel brought their operating system, recorded on a 2316 disk pack; customer programs; and customer data.

"The SBC software, normally run on an IBM 360, was loaded into the ES-1040 via an initial program load (IPL) and the customer programs were successfully executed," Koenig said.

CDC concentrated most of its evaluation on the performance of the CPU, since I/O-bound jobs would have been highly affected by the restrictions of a single selector channel as well as by the peripheral configuration, he said.

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A Gibson mix analysis, which evaluates CPU performance primarily in a scientific and engineering environment, revealed the ES-1040 was about twice as fast as the IBM 370/145, two-thirds the speed of the IBM 370/155 and about half the speed of a CDC Cyber 73, he said.

CDC also wrote some Fortran programs designed to test the speed of the 1040 vs. the IBM 370/145.

"The pure floating-point arithmetic tests showed the ES-1040 is three to four times faster than the 370/145," Koenig said.

"On the other hand, a Fortran program stressing memory speed and using only integer arithmetic showed the 370/145 ran that program at twice the speed of the 1040," he added.

Koenig said CDC had not been nearly as successful in running business applications, primarily because of the lack of a Cobol compiler and because they had only a single channel to service both tape and disk.

When the ES-1040 was purchased, CDC also acquired a set of operating software known as DOS/ES, he said, which bears a striking resemblance to IBM DOS. The product set under DOS/ES included a Fortran IV compiler, an assembler, RPG and PL/1.

"In addition to DOS/ES, a more advanced system called OS/ES is also offered," Koenig said. "From the information offered, it appears to be very similar to IBM OS, offering MFT and MVT options."

He added that to his knowledge no ES-1040 systems were using OS/ES, probably because of the lack of adequate mass storage.

No single comparison can be applied across the board to the ES-1040, Koenig said. The CPU stands out as the most advanced element of the system.

Technology Transfer Licensing's Goal

(Continued from Page 12)

those that have little technology also tend to have little marketing know-how and can use that expertise as well.

While there are advantages to both, striking a deal is difficult, he added. The licensee wants the latest technology, but the licensor, usually in the U.S., is faced with export control regulations.

The licensee prefers a joint venture, while the licensor would be just as happy with a straight licensing arrangement, he said. Payment through output, selling in the West and dealing through a barter system all appeal to the less developed company and its country, while hard currency, additional markets of its own and dollars are the wants of the company doing the licensing in the U.S.

Intellectual property – technology in patented and copyrighted material – is valuable, but at what price? Longsworth asked. A company may have poured $10 million into research and development for a technology for which it will get only $500,000 from its licensee.

Licensing can never be an end in itself; it must fit in with the corporate goals of the licensor, Longsworth added. It is important, too, to remember the licensee is a potential competitor.

But the flow back of technology and the establishment of joint efforts are important and can result in a share back of resources.

A licensee must be managed carefully, Longsworth cautioned. The licensor must avoid the "tail wagging the dog problem" where, for example, a licensee demands and gets a modification of the licensor's product line to meet his particular needs.

The licensing process itself can control the transfer of intellectual property and technology, Longsworth said, particularly if it is in the form of a joint venture.

In looking for a company to license, he suggested the licensor consider the candidate company's skilled labor, its management ability, its marketing capability, the political stability of the country it is in, the attitude of the firm and its country toward licensing and the volume of business it is likely to do.

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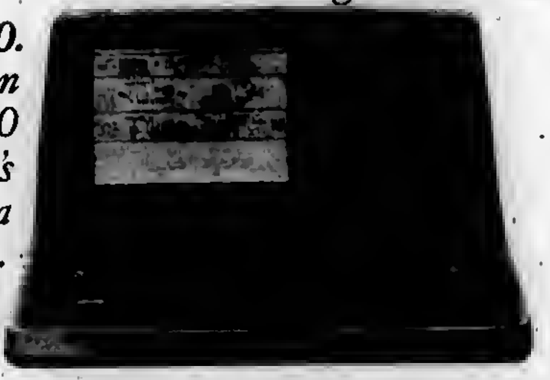

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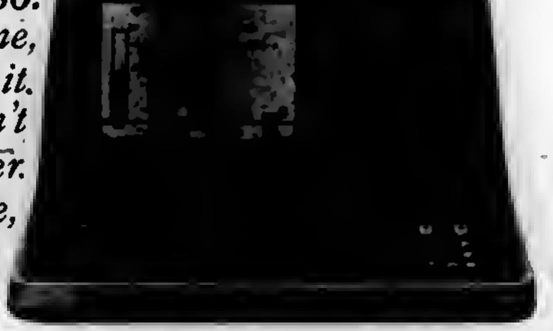

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Datagram vs. Virtual Circuit Hot Topic, But Panelists Agree Standards Desirable

By Ronald A. Frank
Of the CW Staff

NEW YORK – Despite claims that universal protocols are desirable, two major approaches are developing in international communications networks, panelists at an NCC session on computer networks said here last week.

And the results of current communications standards efforts may favor IBM, according to Louis Pouzin of the Iria network research institute in France.

The two major approaches are the virtual circuit and the datagram interface protocols; several versions of the former are now being implemented, Anthony Rybcznski of Bell Canada said.

The virtual circuit is exemplified by the CCITT X-25 protocol which is operating in an experimental mode on an IBM 3705 for initial use later this year on the Canadian Datapac network, he noted.

The X-25 protocol is also compatible with the Telenet packet-switched network operating in the U.S., Barry Wessler of Telenet Communications Corp. observed.

But it is too early to evaluate the relative efficiencies of datagrams vs. virtual circuits, Pouzin said, because there have been no real implementations of either approach on a widespread basis.

Little market need has been seen thus far for datagrams, while virtual circuits have more appeal to users, Rybcznski said.

Pouzin disagreed with this, however. Datagrams have an "identified market," he said, but arm-twisting is taking place to turn potential users toward the virtual circuit protocol.

When network users are interested in a "transport facility" to move their data, datagrams appear to have an edge over virtual circuits, Pouzin said.

When a network becomes a terminal handler, adaptations are more complex and require character stream Interfaces; intelligent terminals would make this problem disappear because they can use a datagram interface, he explained.

Carriers Nixing Datagrams

Although various groups are calling for a datagram interface, the carriers are opposed to it. Four carriers are "rushing a virtual circuit protocol through CCITT," Pouzin charged.

These carriers want to take over terminal handling and, eventually, other processing functions as well; datagrams would leave too much freedom to the customer, he said.

"The political implications of the carrier policy suggest that better boundaries be drawn up between carriers and data processing," he remarked.

The political significance of the controversy between datagrams and virtual circuits signals a power struggle between carriers and the computer industry. "Everyone knows that in the end it means IBM vs. telecommunications," he said.

It may be tempting for some governments to let their carriers monopolize the DP market as a way to control IBM. "What may happen is that they fail in checking IBM, but succeed in destroying smaller industries," Pouzin warned.

Wessler, supporting the use of the virtual circuit approach, said it is to the advantage of users, vendors and carriers that standards continue as they are presently going.

"The benefits to accrue are simplified design and use of equipment, lower cost, higher transmission efficiency, interconnectivity and enhanced performance," he said.

The X-25 interface recommendation has been implemented in Telenet, the Canadian Datapac and the experimental French RCP network. The protocol has also been specified for use on the French postal and telegraph authority's Transpac and the Euronet international network being developed by a number of European telecommunications administrations, he said.

CW Photo by A. Dooley

Checking Out

NCC attendees could get their groceries on the floor of the convention center – but only if they were lucky enough to watch a demonstration of IBM's supermarket scanning system for items marked with the Universal Product Code.

Research in Parallel Processing Questioned as 'Waste of Time'

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Business DP users may not yet be seeing the results, but there is a great deal of work going on in parallel processing around the world, an NCC panel session here last week revealed.

At the same time, however, the session also showed there may be some dissension among the academicians and other researchers over the value of such research into high-speed computer systems.

The major reason for turning to parallel systems, according to Liba Svobodova of MIT, the session chairwoman, is to enable designers to build faster systems because present technology cannot increase the speed of processing past certain points governed by the law of nature.

And the panelists – including H. Sechovsky from the Research Institute for Mathematical Machines in Prague, Czechoslovakia, and J.P. Agrawal of the Indian Institute of Technology in Madras, India (whose paper was read since he was unable to attend) – seemed to agree faster processing speeds were the main reasons for parallel systems.

In addition to the possible faster processing speeds with parallel systems, Sechovsky suggested, higher reliability and fault-tolerant computing could be the end result of research into parallel processing.

He also said better integration between the hardware and software components of a system should be possible with the use of parallel computer systems currently under development, since LSI technology allows a designer to build some functions commonly viewed today as software into the hardware.

But Dr. Clarence Ellis of MIT took a different tack and suggested some of the work in parallel systems might actually be a "waste of time."

Previously we lived in the "romantic era," when systems were designed to be bigger and faster; it was thought a system could be designed to solve all of our problems with computing, Ellis said.

The IBM 360 line and later systems such as the Illiac IV were attempts to move in this direction, he said, as were programming systems that promised to be all things to all people.

But those machines often turned out to be large and clumsy, and several of the large parallel processor designs since then have failed, he noted.

"Now we are moving into the modern era," he said.

The problems no longer center on machine speed, he said, but rather concern the simplicity and structure of systems.

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Systems Vendors Blamed

DOD Reports Security Still a Problem

By Nancy French

Of the CW Staff

NEW YORK – Security is still a problem in the Department of Defense (DOD), but not in the way columnist Jack Anderson would have one believe, a panel of security experts said at NCC here last week.

And the problem is being exaggerated in networking and systems shared by both classified and nonclassified users, according to Eugene V. Epperly of the Office of the Deputy Assistant Secretary of Defense for Security Policy.

James P. Anderson, an independent computer security consultant, blamed computer manufacturers for the lack of progress.

"As a group they don't see a significant market for secure systems outside the Department of Defense," and "they are not willing to commit themselves to costly R&D efforts without DOD sponsorship," he said.

Although a DOD security task force hammered out security policy in 1970 and published a manual two years later, "no manufacturer has a fully certified secure operating system even today," Anderson said.

A look at security projects under way reveals "it's a Digital Equipment Corp. festival," he said. "Nothing has been implemented on the Burroughs Corp. B1700, Control Data Corp. or NCR units or, with apologies to 'Multicians,' Honeywell systems either, Anderson told attendees.

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Furthermore, "we still have no definition of a secure network," he said.

Other panelists – from DOD – offered descriptions of what Anderson referred to as "interim measures."

Since the number one security axiom is "100% security is impossible to obtain in the real world" because of costs or other constraints, DOD agencies attempt to be "relatively secure," according to Epperly. They do this by employing security barriers in "complimentary combination" to achieve defense in depth, he said. The objective is to make the cost and risk of penetration exceed the value of the payoff, he said.

However, there is a basic conflict between good security measures and users' operational requirements that put more and more computer terminals in remote locations, according to William Leary, who works with DOD's Office of Telecommunications Command and Control Systems (TCCS).

Security measures at the high end of the spectrum are aimed at deterring or detecting the intruder, "or some graceful degradation" of that goal if the maximum is not attainable, he said. The objective is to avoid data being stolen or manipulated or a situation where service is denied by a carefully engineered system crash, Leary said.

TCCS has had a general-purpose message-switching system in operation since the 1960s that offers an example of security measures in use today.

In it terminals are physically protected, and all personnel with access to them are cleared to the highest level of data that is entered there.

Second, the circuits are link-encrypted; and, third, switchers are isolated, with personnel at these sites cleared to the highest level of information that passes over the network.

Data is sent in asynchronous blocks in a half-duplex way, he said, and the system has no ability to generate code in the switchers, he said.

The Air Force's Advanced Research Projects Agency (Arpa), too, has several security projects of its own under way "although we still have not solved the general-purpose computer security problem," Steve Walker, an Arpa spokesman, said.

Arpa is using the security kernel approach, whereby security code is isolated into as small a module as possible to assure "it doesn't do anything more than what it's supposed to do," he said.

Hardware insures that other software can't be used to modify the security kernel, he indicated.

Among Arpa's ongoing security projects are kernelizing the control program of IBM's VM 370 system, a DEC PDP-11 security monitor and a message system, he said.

Arpa is also working on an end-to-end encryption demonstration in which data is encrypted before it is transmitted on the network and translated back after it is received at the other end, he said.

Ongoing security activity is combining the National Security Agency's security expertise and Arpa's network protocol expertise, he said.

CW Photos by A. Dooley

Step Right Up

Datum was dealing deliberate details for determined NCC devotees.

Word Processing Seen Merging With Data Processing in Future

By Catherine Arnst

Of the CW Staff

NEW YORK – The convergence of word processing and data processing is definitely part of the future, according to Robert LaDue of IBM's Office Products Division.

And "it's a pretty safe bet the systems that will result will be cost-justified," he told an NCC session here last week.

"People ask, 'How did the office drop out of the mainstream of progress?' The answer is that the office was never in the mainstream of progress in the first place," he said.

But word processing should put the office into that mainstream, he indicated. "Five years ago, word processing got blank looks"; now there are all kinds of reactions to it, both good and bad, he said.

Word processing should significantly change the behavior of an office, possibly even to the point of creating a paperless office, he predicted.

This would be a switch from today's office environment – there are now more white-collar than blue-collar workers, and "their job is to sift through ever-increasing paper," he said.

Most word-processing systems are currently geared to making the secretary more effective, he said, adding there has been a failure to provide the same service for management.

Energy has been misplaced in this case, LaDue said, because management's time is far more valuable in terms of cost.

The time spent by a manager to write a letter will be the most expensive components of that letter by 1985 since nothing has been done to automate his job function; all attention has been focused on the secretary or office clerk, LaDue said.

A word-processing system must, however, be able to accommodate the human element which will work with it. "There must be a growing concern for the human capacity for change" and that change should be evolutionary rather than revolutionary, he warned.

Two years ago IBM began research into the nature of work to determine how word-processing systems can fit into an already existing office. It discovered there are two basic types of offices: the custom office environment, where the duties of employees constantly change, and the production office, which has routine functions performed consistently by the same person.

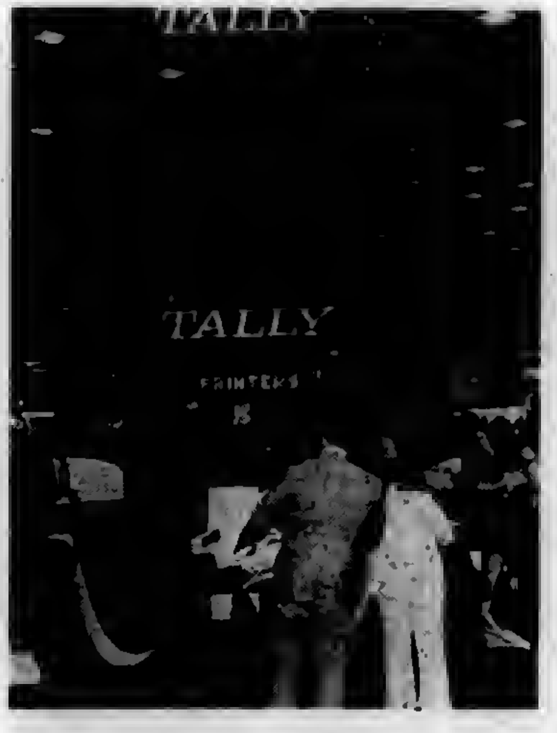
"One system will not work for both types of office" and one of the worst mistakes that could be made is to try and design one that does, LaDue said.

"The key to success of word-processing systems design is understanding the nature of the work environment. Don't let [the system] be too sacred in design," he added.

LaDue emphasized that the system that is designed should not be aimed just toward increasing the productivity of the secretary; the manager should have the same productivity aid.

And, when designing word-processing systems, it should be kept in mind that "this is not a technical universe, but a personal one," and the system should be designed for people, LaDue said.

The potential for word-processing systems linked to data processing is great; it only needs a systems approach and a commitment of resources from manufacturers, he concluded.



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Quality, Not Method, Key to Structured Design

By Don Leavitt
Of the CW Staff

NEW YORK – Top-down vs. bottom-up implementation of a program or system disappears as an issue if the design work is good and the user doesn't try to solve several significant problems at the same time, according to consultant Larry Constantine.

As one of the panelists at a heavily attended NCC session on structured design, Constantine said a well thoughtout design and "a structure chart of some kind" can provide the insight "top-down" programming was intended to discover.

Although they disagreed sometimes on specifics such as the definition of a module and generally on whether data flow or data transformation should be the critical factor in identifying the boundaries of modules, the panelists tended to agree orderly preparation before any coding is started is more important than whether "rules" of structured programming are always followed.

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A well thought-out design is far more important than either top-down or bottom-up implementation, according to Glen Myers of IBM's System Research Institute. As long as the programmer works piece by piece, integration and testing is relatively easy and "certainly better than the big bang approach" that characterizes the testing of monolithic systems, he said.

In some evaluations, programs written in the traditional bottom-up way have been judged better than top-down efforts, Myers noted.

In his introductory remarks, session chairman Ed Yourdon of Yourdon, Inc. explained structured design is the art – "Or is it a science?" – of deciding which components, interconnected in which way, will best accomplish the goals of the project.

In support of that definition, Yourdon said five elements have been identified as part of structured design: documentation, theory, heuristics, strategies and implementation efforts.

Documentation ranges from IBM's Hipo charts through data flow diagrams, and the choice in any given project is pretty much a personal one, he indicated.

Theory is perhaps the strongest aspect of structured design, he went on – it gives an order and purpose to the whole subject. The terminology's meaning is sometimes debated, but coupling and cohesion of data are part of the scene and so is information hiding and structure clashes, he said.

Heuristics, or rules of thumb, abound and include debates about module size, span of control, scope of control and scope of effort, he added, while strategies take one into the range of transaction-centered vs. transformed-centered design, backtracking and program inversions.

In his formal presentation, Myers described what he called the source/transform/sink decomposition approach to determing what is really involved in a user request for DP support.

In outlining the problem structure, Myers warned it is vital to recognize this is not the program structure. The analyst must determine what the ultimate end user wants to achieve, not how the programmer will achieve that goal, he said.

Once the problem is broken into parts related to data transformation activities, the analyst identifies the major input and output data streams, then pinpoints where these streams start and end within the problem structure, Myers said.

That breakdown should therefore identify the input, processing and output portions of the problems, and detailed design on each of them should provide similar subdivisions within each of those subsystems, he said.

Static and dynamic verifications can then be applied to make sure the modules being defined are coherent and comprehensible, he added.

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Software Dilemma Seen: Share or Reinvent the Wheel?

By Don Leavitt
Of the CW Staff

NEW YORK – There is a growing reluctance on the part of installations to share software with others even while there is also an awareness that such reluctance causes pointless, expensive "reinvention of the wheel," panelists at an NCC sessions here last week agreed.

This strange situation occurs, session leader Margaret Butler of Argonne National Laboratories said, because sites have become extremely proprietary of their own efforts.

This harks back, in all probability, to IBM's unbundling and the awareness that software "really does have a value," she said.

There are small instances in which sharing is still almost a way of life, but as an example of the current trend she noted the library built up over the years by the Univac Systems Exchange "seems to be weakening lately."

The Argonne Code Center, which Butler directs, was organized in 1960 as the central point for distribution of all code used by the U.S. Atomic Energy Commission labs and contractors for reactor problems. In 1972, it was designated an agencywide software exchange and information center supporting a wider spectrum of problem areas including commercially available software.

GSA Exchange

Last February, the *Federal Register* announced the formation of a Federal Software Exchange under the General Services Administration (GSA) "for interagency sharing of common-use software," Butler told the session.

Unfortunately, she added, it still isn't clear how this operation will affect such ongoing efforts as the Argonne Code Center.

The GSA exchange may very well detract from the work of current specialized interchange efforts rather than enhance them, she said.

Outside the strictly government arena, Butler spoke highly of the efforts of such publications as the *ICP Software Directory* and its "Million Dollar Club" as a means of bringing users and developers of software together.

No Guarantees Possible

On a more esoteric level, Dieter Fuss, director of the computerized thermonuclear research network based at Lawrence Livermore Laboratory, outlined how that effort has provided a real sharing of software – and computing power – among four sites.

More sites are expected to be linked into the net by the end of fiscal year 1976, but the buildup of the program library through acquisition of software from commercial sources has run into problems, he admitted.

The problem basically is that vendors want protection and assurances their software won't be disclosed to unauthorized people, Fuss explained, "but with our interactive mode of operation, we just can't give that kind of guarantee."

The solution would seem to be to find mutually acceptable conditions within the contract language, to pay to ease the restrictions or to write the software in-house, he said.

The first two options are generally quite difficult to work out, "so we build an awful lot of our own code," he concluded.

Different Sort of Problem

Walter B. McRae has a rather different problem. He is the director of the Computer Software Management and Information Center (Cosmic), sponsored by the National Aeronautics and Space Administration (Nasa), which was started nearly 10 years ago as a means of making available to any domestic users the software routines developed by Nasa and its contractors in conjunction with the space programs.

This software has been paid for by the original using agencies, so the programs are available essentially for the cost of distribution. There are about 1,500 programs in the Cosmic library now, the majority in engineering and mathematical areas, and they were all put through acceptance tests before Nasa would allow their use.

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But McRae has found there is no "good mechanism" for letting the public know about the availability of these programs; there is incompatibility across hardware vendor lines even in compilers of "standardized" languages; and there is no "generally accepted" vehicle for transferring the program logic from Cosmic to the user site – "except the 80-column card, and there are some problems even there."

The problems of attempting to share software is "exacerbated by the incredible growth of minis, micros and programmable calculators," he added.

Prof. Stanley Hagstrom of Indiana University was more optimistic in general than the others. He runs the Quantum Chemistry Program Exchange (QCPE), which started in 1962 when a number of researchers saw a value in letting others know of routines they had developed but didn't want to bother publishing in computer-oriented journals, where they would be subjected to refereeing.

The result is a library of routines – almost all in Fortran – ranging in size from 100 to 30,000 statements – each of which is available to QCPE members for $20 "plus postage and any documentation we might put together."

Hagstrom and his staff make no effort to check the programs submitted to the exchange, but he strongly supports active feedback to the developers when users have comments, suggestions or complaints.

It is "probably essential" an exchange such as this is based at a large university, he said, since "considerable technical expertise is right at our fingers in case of a problem."

Program Transfers 'Inevitable as Death, Taxes'

By a CW Staff Writer

NEW YORK – Conversion or transfer of application programs and files or data bases from one computing environment to another "is as inevitable as death and taxes," Prof. Alan G. Merten of the University of Michigan said in introducing an NCC session here last week on transferability problems.

In fact, Merten emphasized, there are three components to most conversions: the application programs, the data and the job control statements.

Each has its own unique problems, he said, noting JCL is often the only thing a user has to work on in moving from IBM's DOS to OS – "but that's enough."

Conversions are problems today because no one recognized until recently that the conversion effort causes some of its own peculiar problems. In the old days, the hardware manufacturers generally considered conversion "strictly the user's responsibility," Merten said.

The conversion of existing programs got all mixed up with the integration of new programs and data into the new environment; the costs were hidden and, because there was no generally acceptable approach to the problem, there was the classic reinvention of the wheel in every shop, he said.

It is only recently that conversion has been recognized as a separate problem for the DP community. With that recognition, a whole evolution has been set in motion, Merten said, adding the hardware manufacturers are providing help to a much greater extent than ever before.

Beyond that, he said, users have recognized the cost and the complexity of the effort, quite apart from any new development work going forward for the new equipment.

Concern about the cost of converting data, even if the programs can be brought over "as is," has been heightened for those users who have data base management systems rather than mere files, the professor noted.

Seven Changes Identified

Robert A. Marion of the Defense Communications Agency (DCA) noted the Department of Defense recognized its own need for "some kind of automated tool" to help with the conversions in which it becomes involved.

The changes are frequent and usually difficult because they entail mutiple changes at one time, he said.

Looking at the problem, especially in relation to data base systems, Marion said his staff identified seven different combinations of possible changes in operating system, data manipulation language and data structures. The simplest of these entails a change in only one of these areas; the next "layer" involves two changes, while the seventh possibility is a change in everything.

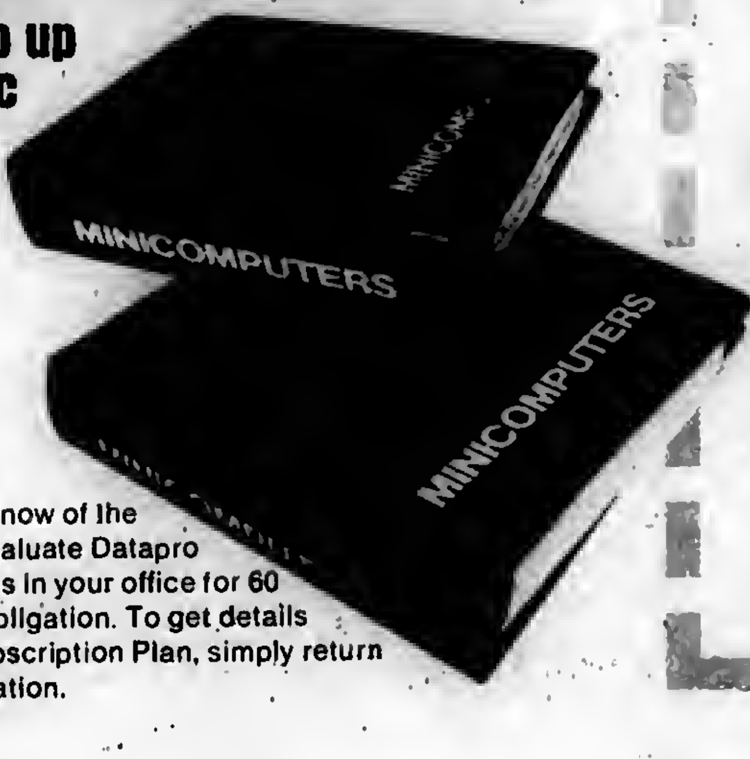
Although individual conversion programs could be created to handle each of these situations, he said DCA thought "it would be good" if it could have one package to handle all seven combinations, with different parameter cards shaping the processing required on any given run.

As the agency looked at the problem more closely, however, it saw the need for a "bridge" rather than just a data translation effort, Marion said. Then, mixing his analogies, he drew a pyramid to illustrate the things that had to be addressed by this visionary product.

There were five layers in Marion's pyramid, with data description language at the bottom followed by the data base, the data manipulation language, application software and, finally, operating system software.

Thus far, he said, DCA has gotten well into its work on data base and tentatively into parts of the manipulation language and the applications area.

Dr. Elmer Bartels, manager of software development for Honeywell, Inc. in Billerica, Mass., was equally pessimistic: the best way to handle a conversion is to avoid it, he said.



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CW HH

2000 Envisioned Without Newspapers, Commuters

By Nancy French
of the CW Staff

NEW YORK – In just 24 years computers and telecommunications will have eliminated newspapers as well as the daily commute to work, but computers that work with natural language and unstructured information retrieval systems still will not be a reality, a panel of "futurists" predicted here last week.

At an NCC session on "Information Processing in the Year 2000," Walter L. Anderson of the U.S. General Accounting Office predicted computing will become the largest U.S. industry by 2000 A.D., with 90% of the nation's workers dependent on computers for their livelihoods.

In that year managers will have "computerized office assistants" that can be taught like a secretary with an IQ of 60, but this assistant "will never forget a function once taught," according to Fred G. Withington of Arthur D. Little, Inc.

While there will still be "no crashproof systems" in the computer rooms, there will be reasonably "foolproof systems," but "no damn foolproof systems," he jested.

Circuits will cost 15 to 20 times less than they do today, but as early as 1985 "we will have learned we can't continue to pour bushels of circuits on a problem – we'll have to start thinking," he said.

In the postindustrial society the panel envisioned, the nation's 262 million people will be divided into self-sufficient communities of a size compatible with the resources they depend on, according to Margaret Butler of Argonne National Laboratory.

CW At NCC

The typical home will be equipped with a video computer communications console consisting of the basic video telephone and microprocessor, with optional light pen and graphics capability, an alphanumeric keyboard, video recorder and camera, facsimile transmitter and extended computer capability, she said.

For $500 the average family will be able to install a transceiver on its roof and, by sending up a password, receive anything from college courses to the latest pornographic movies, according to Withington.

The workday will be considerably different from that of today because most white-collar workers will work at home, using their communications facilities to conference with fellow workers who will also be at home, Butler said.

Automated shopping services, consumer advisory service, emergency medical counseling and utility meter reading will all be available via the console, she said.

Education will be enhanced by TV class instructions and electronic access to libraries, she said, and weather forecasts, an events calendar, open meetings of governmental units, electronic mail and a ticket reservations system will also be available.

Health care ranging from patient interviewing and history taking to diagnosis and prescription review will be available via the CVV.

In the government sector, computers will be used for everything from estimating crop production to automated traffic control and TV surveillance combined with computerized crime detection.

Life Still Not Perfect

Despite the advances the panel predicted, computers will not have solved all problems by the year 2000, according to Murray Turoff.

Long-term planning still will not be considered a serious endeavor since computer modelers will not have a model complete enough to predict the annual agricultural cycle, he said.

Turoff, who is with the New Jersey Institute of Technology, predicted hard-copy newspapers will not even be missed by the year 2000 since even the *New York Times* will have been computerized since 1993.

"By the year 2000 the only hard-copy newspaper left will be the *Ludite Worker*," Murray joked.

And, also by the year 2000, the average home will have been spending as much on computers as it does on automobiles for 12 years, he said. "By then everyone will have realized why IBM took over *Good Housekeeping Magazine* back in 1977," he quipped.

Text-processing systems will be so sophisticated "we'll be able to dial emotional content into our writing," he said.

Descriptive and Prescriptive

Because of passage of federal data property rights by 1980s, people will have to pay a service charge to be included in a data bank. Without it, the individual will not be able to obtain any services, Turoff said.

Descriptive data bases will have become so prescriptive that, after collecting information about doctors, insurance companies will set malpractice rates on an individual basis, he said. As a result, doctors will shy away from high-risk cases, making it necessary for the government to set up special treatment for them.

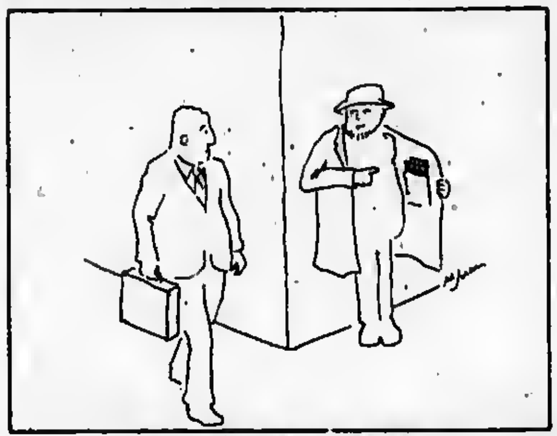
The biggest bureaucracy of the day will be the Jobs Allocation and Welfare Service (Jaws), he predicted.

Jaws' official function will be to monitor and tax production using that tax money to create jobs. However, its secret mission will be to introduce errors into transaction systems, making it necessary for companies to hire more people to isolate and correct those errors, he said.

One attendee, questioned the overall wisdom of increasing people's interaction with machines and decreasing their association with people.

In reply, Withington said he hoped machines in the year 2000 would be graceful enough to help people communicate rather than isolate them still further.

Others suggested the trend toward working at home would finally liberate a person from choosing a home convenient to work rather than near his recreational and emotional interests.



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But Some Must Settle for Less

Planning for Long Range Best Approach, Users Advised

By Esther Surden
Of the CW Staff

NEW YORK – "Those users who need to get away from the crocodiles must focus on shorter term planning before going to long-range planning," according to Ephraim R. McLean, associate professor at the Graduate School of Management of the University of California at Los Angeles.

Speaking before a large audience at an NCC session on "Long-Range Planning for Computer Usage in Large Organizations," McLean said long-range planning is definitely more advantageous for a company as a whole, but those companies which are poorly organized or underdeveloped may not be ready for it.

McLean focused on a type of management planning he termed "strategic" – planning which deals with managerial concerns – as opposed to shorter term planning, which is focused on operations. He defined a management information system (MIS) as that cluster of activities which surrounds the computer and its personnel.

"It is no longer feasible to have systems for their own sake," he said.

Jobs for Planners

The first task for long-range planners is to define the character of the information services organization, McLean said. Once that job is done, the next task is to assess the MIS environment and consider the risks and opportunities in projects to be undertaken.

Planners should next set MIS objectives and develop broad courses of action to achieve those objectives. After this, policies must be determined, he said.

Policies are guidelines to be used in carrying out strategies, McLean said, and include such concrete plans as whether to use steering committees and what procedures should be used when dealing with vendors.

McLean identified three types of planning that can take place within an organization. Strategic planning does not deal with specific projects, but with types of user needs that will emerge in the future. This focuses on what will happen in a five- to seven-year range, he explained.

The second type of planning designed to meet the needs of the host organization is in the two- to four-year range; the third, short-range planning, deals with the creation of timetables and performance target dates.

"Many organizations falter when it comes to planning because they try to carry out all types simultaneously," McLean said. The correct order, he advised, should be long-range first, medium next and short range last.

CW
At NCC

Most organizations are not developed well enough so they fall into the medium-range planning area, he noted, suggesting these organizations create a "hopper of opportunity" to identify potential projects the MIS department could undertake.

The projects should then be evaluated, ranked by priority and finally translated into action via plans.

Ways to identify opportunities that can be approached are varied, McLean said.

The isolated approach, identified as waiting until new legal requirements force the firm to revise an application or until obsolete equipment makes it worthwhile to retrofit a system, is one method of setting goals for MIS; another is to emulate other successful companies and the projects they have developed for their systems, McLean said.

The "bottom-up" approach could be used to find out what the system users need or want and then develop the means to implement these applications; the "reactive approach" responds to requests made by high officers of the company for needs they see, he said.

A "derived top-down" approach can be used when there are no standard MIS corporate policies; the MIS department must hypothesize what the policies would be and try to develop projects to fulfill these hypothetical goals, McLean said.

A true top-down way of handling the MIS would be to incorporate all projects undertaken by the department as part of a general business plan. An interactive approach could integrate MIS with the planning activities of management throughout a company, he said.

After the "hopper" is full of all the projects that need to be undertaken, a problem remains as to which projects should be acted upon. A summary evaluation without a detailed feasibility study can help to rank all the varied projects, he added.

After this step is taken, the establishment of a steering committee can be helpful, McLean said. "Many steering committees have been ineffectual," he warned, because they have been unable to resolve competing demands for limited MIS resources.

For a steering committee to be useful, it must have clear-cut guidelines to translate projects into action plans, he said.

One concept the MIS managers should remember, McLean said, is that "planning processes and decision-making processes are dynamic, not static," and the managers must measure progress against results.

Plans and strategy should be flexible and able to be changed if they need to be, he said.

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Understanding Business Vital

Sound Design Requires Knowledge of Who Must Use MIS

By Esther Surden
Of the CW Staff

NEW YORK – The key question in designing a management information system (MIS) is "Who are you designing the system for?" according to P. Duane Walker, senior vice-president of Humana, Inc., a hospital management company.

Information systems should be designed for the general manager, the person who sits at the top of a major division and whose primary mission is planning and control. Usually this person has a staff which helps him do planning and deep control of business and which also uses the information systems staff, Walker said at a session at NCC here last week.

The other executive is the "resource executive," Walker explained, and this person is the executive the manager uses as a service, such as the personnel manager.

"Since 1955 too many people have been concerned with operational control. You should not be addressing this area," he told the group, but should be helping top management make better use of cash, people and resources.

Operational control is single-task-oriented, he noted. Many MIS people attack a problem and ask about the operational aspects. The right way to attack a problem is to understand the plans of the business in which the system will be a part, he noted.

In long-range planning, a management system goal is established and then passed on to the staff people who bring it down to the base of the company, Walker said.

Users should be aware of the architecture of their systems, how "things are going to fit and how the data relates to processes." The top three levels of architecture are the system designer, the application architect and the information system architect. The latter understands the architecture of "where it is you will be taking a particular business."

Valid Data a Must

Remember that "to make decisions you have to have valid data," Walker warned the group.

Describing the system used at Humana, Inc., he said, "too often we have developed a project and data base at each individual level to end up with all that redundant data we have in many of our large organizations."

"I am suggesting you begin to say what is more important" and make sure this doesn't happen.

All resources have four phases to their life cycles. First, requirements are determined; next, the make/buy decisions are made; third, decisions relating to maintenance and control are made; and fourth, decisions relating to the retiring of a system or program are made.

To effectively manage the MIS department, one must begin to understand the business flow and determine the data base, consolidating those operations that use the same data.

CW
At NCC

At Humana, the firm had three alternatives in organizing the data and satisfying the user's needs. One alternative was to put a computer in every hospital. This was ruled out because of expense.

The second alternative was a combination of minicomputers and data services. The third alternative was putting minis in the hospitals linked to a large system.

The firm chose Four-Phase Systems, Inc. minicomputers with 32 terminals and installed them in their hospitals. The system at the top was an IBM 370/158 with 1M characters of memory.

The results of this has been to capture lost charges that were formerly forgotten; to eliminate duplication in admissions, data gathering and people; and to save money by going to minis from IBM 1800 systems, he said.

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Cost Savings Held Justification for Planning Effort

By Esther Surden
Of the CW Staff

NEW YORK – "If it doesn't save you money, don't do it," J.B. Gearhart, vice-president and director of management systems for TRW Defense and Space Systems, told an audience at an NCC session on long-range planning for computer usage in large organizations.

Speaking on "Strategic Planning of Management Information Systems [MIS]," Gearhart said the interaction between planning and the environment has an impact on "what your MIS should be."

TRW is firmly committed to a user orientation in management systems work, he noted.

"The set of systems our company has is a total system; we are not reactive; we look upon MIS as a discipline, an aid to managers to get things done," Gearhart said.

This has been easy to sell as a concept, he added.

"You can't afford not to plan in the first place," he told the group. Planning allows a "continual search for maximum payoff with the resources you have to work with," he said.

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When planning, a requirements analysis is the first step – look at how the user organization does the task now and make sure it understands the procedure it is using thoroughly.

The user should be asked what is wrong with the way the project is being handled; then "let the user tell you how he'd like to have it done."

The next stop is to develop a plan to get to that point, he said. Sometimes just the process of analysis will clear up the user problems, Gearhart said.

"You find out that they really didn't understand the interface" between aspects of the organization and so use the data inefficiently, he added.

"Remember," he noted, "people use data, data doesn't use itself; and computers don't manage, people manage."

To look at the user's requirements TRW has established a "requirements tree" to reorient the user's thinking on "how to treat the interface."

A question the planners at TRW asked was "What are the basic thrusts one can develop to help guide the department?" One of the guidelines they settled on was the establishment of modular data bases that can talk to each other and can be processed individually.

The firm is also departing from batch processing and reporting because "it costs too much to print" and "on any given printed report, only 5% of the data is used," Gearhart said.

In addition, TRW has gone toward direct access to data through teleprocessing.

One of the very effective procedures the firm has implemented, Gearhart said, is management by exception.

No reports get printed if the system is operating within a given tolerance; only when the user breaches what is preset as acceptable will the system flag the user and print a report, he explained, adding "this works very well."

"We have found that the more rigorously we standardize the way to do things, the easier it goes," Gearhart said and told the group about TRW's "lead executive concept."

Every project that is undertaken has to have the stamp of approval and guidance of a top-level manager, usually a vice-president.

Not only does this give management a stake in the procedure, but it allows input from the person most experienced in the functions it will serve. This is a specific individual who is responsible for system usage, he explained.

The firm also uses the company's regular audit department to do audits on the system. These give the department knowledge in two areas.

First, they tell if the department is maintaining audit control of the system and, secondly, "you can see if your system is really performing effectively.

"If you can't prove it is really cost-effective, you aren't doing your job," Gearhart said.

At TRW, within eight months after a system is implemented the manager in charge is required to state what degree of savings has been realized and where it has been realized, he added.

"All of this has to be flexible and dynamic to meet changing laws, managers and product lines," he concluded.

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With Emergence of Specialists

People Costs Seen Taking 90% of Future DP Dollars

By John P. Hebert
Of the CW Staff

NEW YORK – "There is a possibility that, in the future, 90% of the corporate dollars will go to people; we can expect the 'person costs' to assume an increasing portion of the DP budget and we can expect the trend to continue."

That prediction was made to attendees of an NCC session on "Data Processing Career Paths" by panelist William Rothamel of the University of Illinois in a text written by H.W. Bomzer, also of the university's Urbana campus.

Rothamel, who read Bomzer's speech in his absence, said there have been great changes in the DP budget outlays going to support people because of "extreme pressures on the DP organization."

The most recent product developments in the DP area, Rothemal said, have resulted in the emergency of the specialist, a very important individual who receives a salary commensurate with his increasing knowledge.

At the same time, the computer community has been witnessing lessened demands on the data entry person – a product of the same increase in technology.

Both of these types of people make it increasingly clear career paths are needed to determine future directions each individual and company will take, he said.

"The accuracy of data is being entrusted to the person who knows the least about it," Rothamel said. "I can only hope we are smart enough to provide that person with training."

The idea of career pathing becomes more necessary with the rapid changes and increasing pressures afforded by technological improvements, although the objectives to meet this need are very often not under the control of the DP organization – they are usually under the control of management, Rothamel said.

He stressed that goals for DP career pathing should be both stated in clear terms to management and measurable. These include both long-range and short-range goals, he said, adding their implementation must take place within a definite time frame.

"People in any organization deserve to have a viable career in DP by a well-defined path up the ladder and they should be offered the chance to obtain the skills necessary to go up that ladder," Rothamel said.

Data Entry Necessity

Another panelist, Carolyn M. Denning of Pertec Corp., detailed the necessity of career pathing in one particular area – the data entry supervisor.

"Data entry is now a question of throughput and this is when it becomes a respected member of the DP community," she said.

The result of rapid technological advances running far ahead of data entry has made a serious impact on the supervisory level. There was not a concurrent rise in knowledge that went along with the increased specialization brought about by vendors oversimplifying data entry through advanced technology.

"The supervisor had to see the data entered, verified and transmitted properly," but didn't have the knowledge to fulfill his job function if something went wrong, she said.

Calling technology a burden by "leaving the keypunch supervisor out in the cold," Denning noted there were no classes specifically tailored for the key-to-disk supervisor.

"Data entry more than any other area is a people-oriented environment – a very emotional situation," she said.

For this reason, a "generalized education" is needed to teach such things as terminology so the supervisor can communicate with support people and "alleviate the fear of the unknown," she said.

There are many benefits to good operator training from the management standpoint that optimize the quality of data going to the mainframe, she said.

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DP Role in Air Traffic Control Seen Growing With Technology

By Catherine Arnst
Of the CW Staff

NEW YORK – Automating air traffic control, a complicated process which demands perfection, also demands more and more sophisticated computer systems, according to panelists at NCC here last week.

"In the 1920s the controller did his job by waving a red or green flag; in the 1930s he had a radio; in the 1940s he got radar; and now he must start learning to communicate through a computer," Howard McGlauflin of the Federal Aviation Administration (FAA) said.

FAA first initiated plans to develop an automated system for air traffic control in 1961, when a project task force was established. The result was The Project Beacon Report, which recommended the "utilization of general-purpose digital computers to provide controllers with aircraft position information," McGlauflin said.

The eventual result of this recommendation was the Advanced Radar Tracking System I (Arts), which has been in use since 1966.

Arts uses a general-purpose digital computer together with video digitizers and displays to increase the radar and beacon video on a controller's console. It operates by displaying alphanumeric aircraft identity and altitude information which is automatically associated with the proper video returns.

A variation of this system, Arts IA, was implemented in 1968 at Kennedy Airport in New York City and permits the individual airspaces over Kennedy, LaGuardia and Newark (N.J.) airports to be combined into a single operation by utilizing computers. "This system differs from the Arts I in that it uses two separate, non-collocated radar and beacon inputs," he said.

The FAA has developed a design for an improved air traffic control system, called Arts III, based on experience gained from the operation of Arts I and IA, McGlauflin said.

This system, which is currently being implemented at 62 air terminals, is intended to be a first step in terminal automation of air traffic control and to provide an automation basis on which to build, he said.

Arts III was designed to be built with a modular expandable concept in order to provide the capability for growth of system functions at the same pace with increased requirements and developments, he said.

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FCC Decisions on Competition Attacked as Simplistic

By John P. Hebert

Of the CW Staff

NEW YORK – The Federal Communications Commission (FCC) took some hard knocks here last week as a three-man panel cut into the commission's approach to regulated competition in the data communications area.

In essence, all three panelists at the NCC session on "Legal and Regulatory Trends in Computer Communications" accused the FCC of taking an approach that is both simplistic and unrealistic.

In addition, the three, all lawyers, agreed the commission is taking too long to reach a decision on the issues of competition which, they said, affect not only the DP community but also the general public.

The most troublesome aspect of the regulation of Bell and the common carriers lies in the area of cost subsidization, according to Frank J. Martin Jr., an attorney with the Washington law firm of Sutherland, Asbill and Brennan.

When competition is allowed in certain areas, the FCC wants to be certain Bell does not use its monopoly services revenues to subsidize its competitive services, Martin said.

Martin called this cost subsidization issue the "principal battleground" in the communications field today.

"This is a time of great change in communications policy: The events of the last few years have brought about a crisis in data communications policy," he said.

'Critical Situation'

"Trying to keep up with the issues is a great problem, but it is not a unique situation. It is rather a critical situation," Martin said.

This critical situation relates back to the major change which occurred when the FCC permitted the specialized carriers to compete with carriers who had not previously faced competition.

The "common carrier decision" was a deliberate attempt by the FCC to encourage innovation in data and general voice communications by allowing competition, he indicated.

But when the commission allowed this to happen, he added, it did not prohibit the specialized carriers from offering their services wherever they chose.

The result of this, Martin said, was that the common carriers offered their services in the most lucrative areas – in the cities. This upset a balance because Bell had to subsidize rural areas from its lucrative area base.

The most recent FCC decision to wind up in the courts is exactly this subsidization, Martin said, adding Bell is the company suffering most from this decision.

"The FCC is taking too long," he said, noting that, by court order, the private-line case of the FCC's cross-subsidy decision has to be made by August.

"The FCC has difficulty bringing one of these decisions to conclusion" because the other carriers file for hearings on the matter and the hearings inevitably take a long time, he said.

Great Instability

William Malone, a Washington lawyer representing General Telephone & Electronics and a member of the board of directors of the Computer Law Association, said FCC decisions of the past few years have brought competition into an increasingly broad area in this country with the result of creating great instability in the communications market.

"The introduction of competition into the data communications carrier market has forced additional regulation," Malone said, calling this a "failure of the FCC to appreciate the industry it purports to support."

Questioning whether the FCC is properly carrying out its function, he said the commission has been adopted as "religion," with most people putting their faith in decisions made by the regulatory body.

Malone predicted higher prices for all people who use the voice or data communications services because of the FCC decision to allow specialized carriers to compete with Bell.

The Consumer Communications Reform Act now pending in Congress, is called that because even though businesses initially take on the extra cost burdens of higher communications costs, the consumer will be the one to suffer.

Private consumer telephone usage has risen substantially since the Communications Act of 1934 was passed into law, Malone noted. In 1975, 94.5% of all households in the U.S. had telephone service, he said.

If rates are raised for businesses, it will only be a matter of time before the general public is hit with a 60% to 70% increase in telephone rates, he forecast. "This is politically unacceptable," he said.

"The FCC has not established competition in any meaningful sense if the result is to raise all telephone rates," Malone said.

CW
At NCC

The impact this will have in the future will be a throwback to the 1930s. "We will have areas where there is no telephone usage at all." In rural areas of the country, he cited hypothetical costs of $50 or $60 to make a long-distance phone call.

Thomas J. Keller, general counsel for the Office of Telecommunications Policy (OTP) in Washington, D.C., agreed the 1970 decision made by the FCC stipulating there be no regulation unless it was data communications was a "questionable decision."

Even though Keller said the underlying thought of the FCC concerning issues of competition by the specialized carriers was inadequate, he claimed better regulation is is the most appropriate solution to the problems facing the communications industry.

Competition is needed for improved resource allocation, new and as yet unrecognized management techniques and the exploiting of technology in a timely fashion, he said. The removal of restrictions, he added, would prohibit the advancement of technology and promote risk taking.

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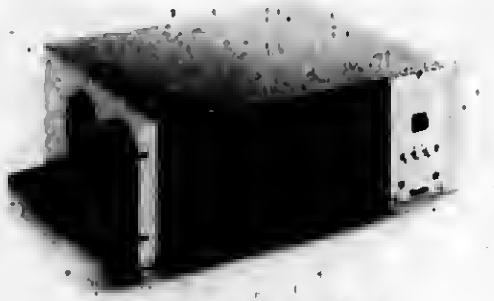

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Editorial

Another Great Job

The largest National Computer Conference – and one of the best – is now history.

And when the history of the shows is written, it will go down in the books as one of the best-run shows ever – which should make the people at the American Federation of Information Processing Societies (Afips) proud.

The show went off almost without a hitch, quite a feat with almost 1,000 booths in the exhibit hall and a multitude of attendees in a hot and muggy New York.

The only problems that arose came from the sheer number of people attending, with long lines the order of the day on Monday and Tuesday as almost 3,000 poured into the convention in those two days alone.

One of the featured speakers couldn't make it for the show, but Rep. Wayne L. Hays (D-Ohio) had things other than computers on his mind during the week.

On the whole, however, the problems did not detract at all from the upbeat show that reflected a mood of optimism in the computer community.

There weren't a large number of startling new products as exhibitors concentrated more on showing well-running and tested systems – giving users proven performance rather than flashy technology.

The wide-ranging technical program, superbly arranged by Stanley Winkler of IBM and Dr. Carl Hammer of Univac, offered something for almost anyone, from in-depth discussion of important social issues in computing to the academic discussion of computers and components that might reach us in the real world in the 1980s.

Exhibitors were happy with the crowds; the crowds seemed happy with the exhibits; and session attendees seemed generally pleased with a minimum of the normal complaining about a few of the specific meetings.

Overall a great show – and another great job by the Afips crew.

'I Always Said Somebody Should Have Complained When They Started With Supermarkets . . .'

Letters to the Editor

Let ACM Election Results Speak For Themselves; On With the Job

When Herb Grosch was good enough to show me the advance manuscript of his May 31 column, I asked that he make some changes in the references to my nomination for vice-president of the Association for Computing Machinery (ACM).

He agreed to try, but warned me the deadline has probably already passed.

My concern was with the motivations attributed to the nominating committee for not nominating me. Frankly I don't know what their motivations were and don't intend to ask, but I doubt very seriously it had anything to do with fear of me as a non-Establishment candidate, whatever that is.

For myself, I would prefer to let the election results speak for themselves. I hope it will be possible to bind up any wounds caused by the campaign, but otherwise I have in mind to forget the past and get on with the job.

Daniel D. McCracken

Ossining, N.Y.

SSA Building to Pay for Itself

As the consultant who made the original recommendation that the Social Security Administration (SSA) build a new computing center, I am appalled by the nonsequiturs recently floating through the press, including *Computerworld*.

SSA's computing is a lot less efficient than it could be if it carried out most of the General Accounting Office's (GAO) suggestions in the Morris Report of a few years ago. That report called for a modernizing of processing methods to emphasize selective on-line processing and for improving its sequential processing.

Both improvements would affect computing personnel costs as well as hardware costs. Each of those costs must now be greater per year than the capital cost of SSA's proposed building. Both improvements need a respectable geographic layout of hardware. Over its useful life, the efficiencies possible in the proposed building would recover its cost many times over.

SSA's proposed building was planned as I suggested so that its space is interchangeably usable, as their DP methods evolve, for hardware or office space. When feasible, starting several years in the future, decentralization could improve both security and efficiency.

Locking SSA into its present space box would not save anything, only inhibit the kinds of improvements in efficiency and security that are needed.

Herbert S. Bright

Bethesda, Md.

Improving on 'Peopleware'

In response to the request for suggestions for a more appropriate marker than "Peopleware," I submit "Humanities."

I find the term "Peopleware" offensive and particularly unsuitable since we are so often accused by non-DPers of trying to dehumanize everything.

Humanities is a recognized and respected field of study in institutions of higher learning; there is no reason it should not be in *Computerworld.*

Thomas Pawlick

Rochester, N.Y.

(Other letters on Page 26.)

Data Past

Five Years Ago
June 16, 1971

HAWTHORNE, Calif. – U.S. Navy Commander Grace M. Hopper renewed her fight against what she called mammoth computer systems, operating systems and management data bases at the joint meeting of Los Angeles Association for Computing Machinery and Data Processing Management Association members. "Operating systems can be eliminated by having modular minicomputers handling delegated sections of programs," she said.

– – –

WASHINGTON, D.C. – A tariff proposal with less stringent protective requirements was to be filed this month by AT&T with the Federal Communications Commission (FCC) in response to objections by data users to AT&T's Connecting Arrangements for voice-grade private lines.

Eight Years Ago
June 12, 1968

NEW YORK – A state judge here ruled Western Union (WU) breached a contract with Law Research Services, Inc., the first customer seeking to offer a computerized legal research service over WU's teleprinter network, after finding WU had delayed putting data into the computer's memory devices, delayed in supplying billing tapes and had raised prices it would charge the research service for WU's services. Law Resaerch claimed a $37 million loss as a result of the WU actions.

– – –

NEW YORK – Dr. Bernard Galler of the University of Michigan won the presidency of the Association of Computing Machinery over publisher Richard Canning, succeeding the retiring president, Dr. Anthony G. Oettinger of Harvard University. Walter Carlson of IBM won the vice-presidency over George Glaser of McKinsey & Co.

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Japan I

To paraphrase Kipling, "But there is neither East nor West . . . /When two strong companies stand face to face, though they come from the ends of the earth!" Those ends would be Armonk and Kawasaki, in the context of a great trip I've just completed: Armonk you all know, and Kawasaki-shi is the principal seat of Fujitsu, just outside Tokyo. I certainly won't be able to crowd all my impressions, personal and technical, into one column, but I'll start today, putting aside my anticipations of the NCC.

I was invited some months ago to address the big annual meeting of the Facom Family, the combined (SHARE plus GUIDE) user group of Fujitsu, at its Nagoya meeting May 28-29. It was my first trip outside of Tokyo in some years, and my first trip ever under purely Japanese auspices. I went first at my own expense, back in 1961 when the idea of computers was brand new in the country, then later for Univac, for the U.S. government, and of course for *Computerworld.* Each time the commitment to a national position in computer development and production was more evident; each time the users were more sophisticated; each time IBM concern was more obvious. I expect to go many more times (this was my sixth); nevertheless, and in spite of the shortness of the visit, this trip was a high point.

For one thing, I penetrated deeper. I not only toured the huge Nagano factor, where the bread-and-butter Facom 230-series medium-sized systems are made, but I was allowed a good look at very advanced research at the Kawasaki laboratory complex. My wife and I had been given an enormously impressive excursion through the Fujitsu LSI production facility, one of the largest in the world, during the U.S.-Japan conference last August – probably to prepare me for the Facom Family invitation! Anyhow, taken together, the three tours gave me much better perspectives on one of the great world computer enterprises.

That was the second thing. Although of course the overseas marketing people were careful not to compromise future adventures by talking too freely, I was pretty thoroughly immersed in hopes, intentions, and accomplishments beyond Japan. The ministries and the individual companies have always been very generous, at IFIP and U.S.-Japan conferences, at the OECD in Paris, and in the media; they not only overwhelm with multifarious data, but they present it handsomely, and in English. This time, though, I was shown what one company saw in Eastern Europe, in Spain (where they have had a recent major success), and in their relationship with Amdahl. Knowing my interest in big systems, they loaded me down with brochures on the big bank network, the Japanese space program, their interaction with Nippon Telegraph and Telephone, and such. I'll be reading it for months!

I flew to Tokyo overnight, from Los Angeles – not the best way to go. Trouble was, I had accepted an invitation to speak at the ACM/ASM Annual Spring Seminar Saturday the 22nd, with the intention of taking the mid-afternoon Pan Am nonstop flight. Then, after both dates were firm, Pan American changed its schedule to depart much earlier, and made the red-eye via China Air Lines necessary. Just one more example of shortsighted and selfish airline sales policy; everybody wants to clump up at popular departure times – the 5PM-out-of-O'Hare syndrome. Domestically it overloads the facilities, and internationally it limits the itineraries; one more example of greed-before-service.

You don't see it yet, or at least not so openly, in Japan. Prices are astronomical: five bucks to clean a (two-piece) suit. But in three hours, if you need it, and laundry the same. Everywhere, even in Tokyo, you feel the struggle to maintain the amenities, to live well together. Costs go up, yes; they go up in New York and Chicago and Topeka also, and we get Mucilaginous Macs, and punks instead of trained help. Ah, well!

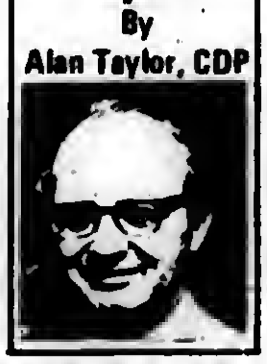
There are 36,000 computers in Japan, far more than in any other country except our own. Their growth rate for the last three years, in numbers, has been only 20 per cent annually – down, largely due to the petroleum depression, from their historical 30 per cent. But the growth in dollars – yen, I should say – has been higher, indicating that the miniwave has not yet hit. The nature of Japanese enterprise, and the well-known willingness to cooperate, to accept organizational decisions, makes the continuing economies of integrated data processing still attractive, and the DEC-encouraged pride ("think how nice it would be to have my own setup") in decentralized installations less defensible. So, growth is still stupendous. The limit is production of trained personnel; there is absolutely no jobhopping, so it must be *new* personnel; poor performers are not fired, so selection and training are vital. To get ahead of my story somewhat, women are increasingly recognized as a major personnel resource; there were five registered at the Nagoya user conference, out of eight hundred; at a similar meeting, and in Tokyo at that, seven years ago, there were none.

I had a short but to-the-point meeting with the new president of Fujitsu, Taiyo Kobayashi, and his top administrative VP, Shoichi Akazawa. We talked about IBM, about research support, about a recent visit I had made to Fujitsu California, about Europe. And, more socially, I had a final chance to report to him on my tours and my observations at the magnificient drinks-food-and-beautiful-hostesses Fujitsu reception following the first day of the user meeting; one gets a lot of business done in Japan at such functions, in spite of the great sake and beer, and the free-flowing and enormously expensive Scotch.

Herb Grosch

Models Show Systematic Method to Handle Exceptions

The Taylor Report
By
Alan Taylor, CDP



Last month in England a judge stopped a case in mid-trial and excluded the public from the court. Then he granted a search warrant-type of order against some people believed to have a 32-page computer printout belonging to Vapormatic Co. Ltd.

Both these actions basically violated some pretty fundamental rights and, in his written reasons for these actions, the judge concerned, Justice Graham showed the basis of some systems work that many computer systems people should ponder.

What apparently happened was the computer printout contained the names of the worldwide customers of Vapormatic. This is pretty explosive stuff, and, with computers' capability of copying tapes, etc., it is now much, much harder to ensure that security is maintained.

It is not sufficient now to see that all copies of the lists get locked up at night, because one really doesn't know whether there are some other, unauthorized or perhaps out-of-date copies of the list around.

In this case, the problem was how to get the list back without putting the people on guard – and to do this properly. So a number of actions were taken systematically.

To protect against advanced warning, the court went in camera as soon as the judge realized what was being asked. As he wrote later, he should have been asked privately, but he was not.

Next, the order, which involved searching the premises of another firm, had to be carried out "satisfactorily, though with due circumspection and proper regard for the defendants' rights" as the judge later put it.

What does that mean in computer terms? It means that when an exception is made – some edit omitted or a test ignored – further actions shouldn't continue down the main path as though nothing has happened. Special procedures for the specific type of case are needed.

For instance, if a name-duplication system suggests there are two master records for the same person, and it is decided to consider them as one, some thought has to be given on how to handle matters should the assumption turn out later to be incorrect.

Fingerhut, a Minnesota firm, is a particularly good example of how to handle that sort of situation. It has a policy that restricts to one the number of customers in a household, but of course they cannot really know what is a household.

So when an order comes in apparently from the same household, but with a different name, out comes a computer-generated letter to the original customer, telling him about it.

Like all of Fingerhut's items I have seen, it is an exceptionally well-drafted letter. First, it tells the person that the order for XYZ has been received and that the goods will be on their way shortly. Logically, it is a quite unnecessary piece of information, but it puts the people concerned at ease. They know there has been no delay.

Then the letter goes on to explain about Fingerhut's policy of one customer per household. It does it quietly and doesn't try to blame the computer for being unable to handle it or to pretend in any other way it is not just a matter of the firm's choice. I like that too, even though it is unnecessary.

Now comes the real part of the letter – it reports action. What is happening is that the new order is already being placed on the original account. Now it is clear why the letter has come to the original account holder, because it is his bill that is going to show the item. Finally, the letter offers to reverse the action if requested.

The policy, it turns out, is not iron-clad. Indeed, to reverse it, only a request is needed. But a request is needed, so now the letter says that, if joining the two accounts is all right, no action is needed, and the matter can be put in the waste paper basket.

But, if the customer wants it reversed, he is asked to let Fingerhut know. And that's the end of the letter.

Now compare that with the procedure in the judge's court.

Dealing with matters a great deal more important than the merging or separating of two mail-order accounts, he followed much the same path. Like Fingerhut, he acted. And, again like Fingerhut, he published his reasons for acting.

The judge ordered very specific precautions to be taken. An attorney was to be present in his capacity as an officer of the court, apparently taking personal responsibility for seeing that everything went off all right. Somewhat similarly, the Fingerhut letter also came from a third-party outside the marketing or the accounting areas (in this case, customer service).

And, as well as just providing for the attorney, the judge wanted any experts who could identify the computer printout or help to find it (perhaps now concealed on tapes or disks or reformatted) to be actually named right in the order authorizing the search. There was no equivalent to this in Fingerhut's effort, but then I can't see any equivalent need.

Even then, the judge was not really satisfied that everything possible had been done. He noted that the result eventually might be an award of damages against Vapormatic itself, perhaps for damage that occurred when it saw the other parties' customer lists. This is equivalent to the Fingerhut offer to reverse the merging of the two accounts.

So, as you can see, there are models of how to handle exceptions both in and outside the computer area. And they fall into a pattern of sorts.

I think it is a practical procedure in almost any case where someone suggests skipping edit checks (for efficiency purposes) or otherwise tries to shortchange safety or standards. Look at the real amount of work involved in changing matters over, and think of the abuses that can occur if the work isn't done properly.

The systems built around decent exception procedures will run a lot easier than some of the efforts we see around today. And, really, done systematically, as both Fingerhut and Justice Graham did, exception handling doesn't take very much work at all.

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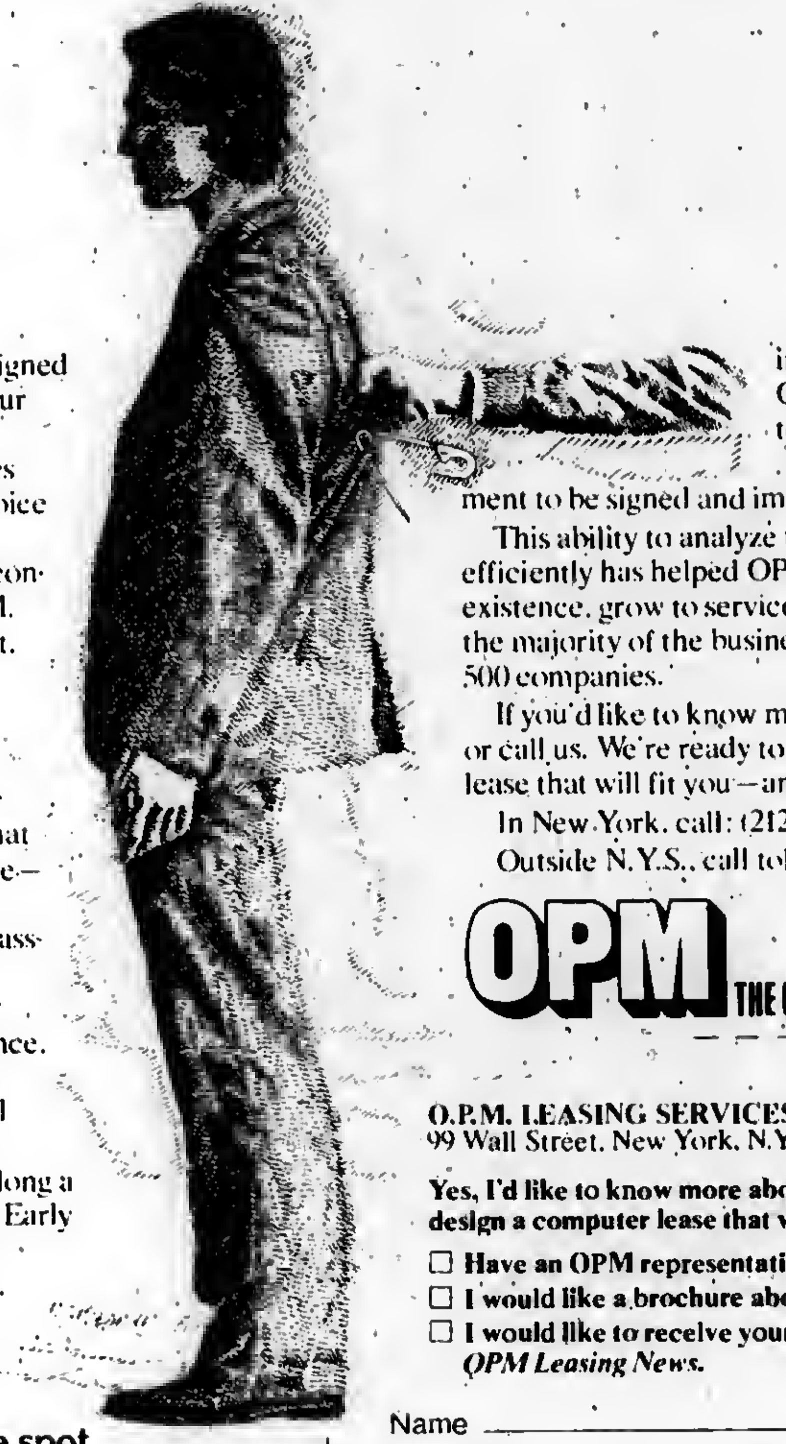

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Letters to the Editor

Hard Sell Not Only Method Of Getting UPC Acceptance

I have been following with interest and bemusement the ongoing drama in *Computerworld* concerning the Universal Product Code (UPC).

First there was the shock of realization that the public wasn't accepting the UPC because it wanted to see prices. Then came the bewildered questions of "why" and "who," followed by finger pointing, breast beating and hair pulling. Everyong seemed ready to junk the whole concept, and then Ray Kaplan spoke up in favor of hard selling the UPC to the American people [CW, May 17].

Personally I do not think even a hard sell (a costly proposition, make no mistake) would work for the UPC as it is now structured because the consumers are always going to want to know what they are paying for something before they buy it. Would Kaplan buy a car or a house without knowing what it would cost him?

There is too much to be said, however, in favor of the UPC for it to be dropped. Easier inventories, faster service and (hopefully) lower prices to the consumer because of lower costs for the wholesaler and retailer are arguments that should weaken even the most ardent UPC opposition.

What no one seems to have realized is that we can have both by going ahead with the implementation of the UPC, ending the practice of marking every individual item in stock and beginning the practice of marking groups of items (e.g., with a label on the edge of the shelf directly under the items being priced).

Jean Vermette
S. Fallsburg, N.Y.

POS Picture Too Rosy

I had some difficulty in determining the objectivity of "Ohio Market Ends Most Price Marking" [CW, May 24] since this story on point-of-sale (POS) usage in a Troy, Ohio, supermarket painted a rosy picture which differed greatly from one published by the *Dayton Daily News* a few months ago.

As I recall that article, there was much customer dissatisfaction both with the lack of marked prices and the checkout procedure, and customers were going to other stores rather than stop at that store.

I depend on objectivity in *Computerworld* articles and this one makes me suspect others of its type. I hope CW's reporters will try harder to get all the facts.

Carl M. Vigil
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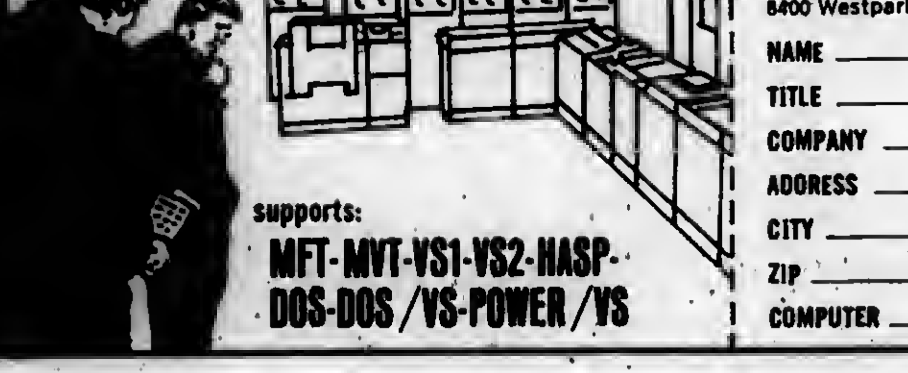

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IMS-Based 'Daisie' Blooms as N.C. Welfare Support

By Julia Van Duyn

Special to Computerworld

RALEIGH, N.C. – From the seed of an idea planted last fall, Daisie – the Data Assistance Information for Social and Income Eligibility system, for the state of North Carolina – has nearly reached full bloom.

It went into pilot production use late last month, according to Earl Wells, the state's DP manager for social services.

An on-line, real-time inquiry and updating system built around IBM's IMS and a 370/155 using OS/VS1, Daisie provides a network reaching out to 100 offices in the various countries in this 500-mile long state.

Ultimately the system should replace much of the paperwork and reduce the delays that plague any program as widespread as Medicaid, Wells said.

The need for such an automated approach was sensed last year by David T. Flaherty, the state's Human Resources Secretary, and Wells was given the assignment on Oct. 13 – "I remember that date: It wasn't a Friday but . . . ," Wells recalled recently.

IMS was selected as the vehicle because of its ability to handle many concurrent data communications users as well as provide support for the complex data base Wells anticipated he would need.

Two other state agencies were already using IMS on the same 155 Wells expected to use, and that may have been the most basic reason for focusing on that particular data base management system. But even after the decision was made, the path through design and coding to implementation was harder than anyone expected.

A Way of Life

With a crew of 16 working on the project, overtime became a way of life, Wells said. He personally accumulated 300 hours of "comp" time which he can take off "whenever I have time – and you know when that will be."

The design work was hampered by a lack of working knowledge about IMS, he went on. As an example, he noted that when the client data base – the first of half a dozen or more needed for Daisie – was first set up, the client's name and date of birth was made the primary index, while the client number was secondary.

This organization was soon found to be too cumbersome and the indexes were reversed. But that entailed changes in "just about every program," Wells explained.

More than that, there were errors within the IMS coding, he said, adding his site has been the originator of "a number of IMS patches" in the past few months.

Some odd situations come up even when his crew isn't deliberatley testing the system; recently it had two logical terminals working at one physical terminal and each was being used in conversational mode. IMS finally couldn't figure out which message was supposed to go which logical unit, "so the system died."

Sometimes the hardware limitations frustrated Wells and his colleagues. The 155 originally had 1.5M bytes of main storage and Wells anticipated a need for 2M bytes to support Daisie.

But one day, the development team "turned the users loose" and told them to "beat the thing to death," Wells said.

Half an hour later they had done just that: they had filled all the queues with legitimate but slow-moving requests – inquiries for client files based on phonetic input of last names, for example – "and so the system just plain died." That led to a request for another megabyte of memory, Wells noted.

Meanwhile, as coding went forward, the state prepared for the Daisie-user interface. Health Applications Systems of Burlingame, Calif., already under contract to North Carolina for other work, was hired to prepare a user manual. "Working with very few of our people, it did a fine job," according to Wells.

The operators who would work with the Olivetti CRT terminals out in the field offices had to be trained, and the access methods they would use had to be tailored to their nonprofessional backgrounds.

"Menu" screens listing the various options open to them and "Help" screens for when things really seemed to be out of hand had to be included in the software; function keys that would be useful in simplifying their input had to be added to the terminals.

'Hawkeye' Standardizes Cobol Coding

CHICAGO – Hawkeye from Blackhawk Data Corp. is basically a text editor, processing the text of a Cobol program one word at a time and formatting it in accordance with a set of general rules, a Blackhawk spokesman said.

Sometimes described as a Cobol standardizer, Hawkeye supports the use of substitution tables so that specified words or phrases in the original source code can be replaced by other specified words or phrases in the reformatted program.

One use of this facility would be to equate several data names, for example, with a single name if several modules written by different programmers are being brought together into a unified program, the vendor suggested.

Alternately, it has been used to "translate" programs from one user language to another. A sample provided by Blackhawk showed just such a conversion from English to Spanish.

Still another use would be to provide a null set as the replacement for an undesired word or phrase, thus effectively deleting it from the updated program, the spokesman added.

Other Capabilities

Other capabilities provided by Hawkeye include the possibility of assigning numeric prefixes in increments of 10 to Procedure Division paragraph names. All references to the newly numbered paragraphs are amended by Hawkeye without user intervention, the vendor said.

Other formatting niceties provided by Hawkeye include indenting of Data Division-level number entries and Procedure Division statements according to predefined rules, skipping to a new page at the start of new divisions or sections and the insertion of blank lines before Level 01 entries in the Data Division and paragraphs in the Procedure Division.

Under a so-called Cobol Laundry service, Blackhawk will run users' programs – preferably in batches of 10 or more – against "Hawkeye" for a predetermined cost per line. This would give users a chance to see how well the conversion works or just use for libraries too small to justify acquisition of the package itself, Blackhawk said.

Otherwise, the package is available for in-house use on any IBM 360/370 or other installations with an ANS Cobol compiler for a one-time cost of $1,800.

Blackhawk Data is at 200 N. Michigan Ave., Chicago, Ill. 60601.

'Compumap' Data Base Enhanced To Improve Truck Route Plans

WELLESLEY, Mass. – An extensive revision and updating of the data base used for calculating the shortest practical truck routes in the continental U.S. has been built into all the Compumap products now available from Logistics Systems, the vendor said recently.

Designed for use by trucking common carriers and private fleet operators, the data base provides users with a selection of "thousands" of origin and destination cities and "millions" of possible routes over interstate, U.S. and principal state highways, according to a spokesman.

The system now indicates toll roads, favors interstate highways for fastest routing and constructs routes around rather than through cities, he said.

Output shows actual highways used, describes route junctions by the compass direction from the nearest city and indicates anticipated travel time for each leg of a trip, he continued.

Special routes that must include intermediate stops for shipment drop-offs, rest stops or other company-specified requirements, can also be constructed with the Compumap system, Logistics claimed.

In addition to plotting routes which may save users 3% to 5% of their current mileage per year, Compumap provides a printout showing total miles traveled, subdivided by state so that state fuel use and highway taxes can be figured accurately, the spokesman added.

Compumap services are available in five forms. A custom service detailing a limited number of repetitive routes is available by origin, destination and other requirements specified by the user. Printed in loose-leaf or hardbound form, it costs $10/route.

At the other extreme, Compumap/On-line is available for installation on a user's large IBM 360/370 operating in a real-time on-line mode under CICS. This version costs $40/mo per tractor unit in the user's fleet, subject to a minimum cost of $300/mo and a maximum of $1,500/mo.

Logistics can be reached through Box A, 60 William St., Wellesley, Mass. 02181.

Software Lets Mini Tie to 'Swift' Net

NEW YORK – Software packages now available from Arbat Consultants of London or Arbat Systems, Ltd. here permit banks that are members of the Society for Worldwide Financial Telecommunications (Swift) to operate Digital Equipment Corp. PDP-11s within Swift guidelines, according to an Arbat spokesman.

Presently Swift management suggests banks utilize Burroughs, General Automation or Singer systems in the international operation. But the operating system, Aims-11, and its application package, Swift-11, have changed that, Arbat claimed.

Aims-11 was described as a high-level programming language similar to Basic; Swift-11 was developed to make existing PDP-11s compatible with Swift's data communications requirements, Arbat said from 61 Broadway, New York, N.Y. 10004.

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New Jersey Team Finds:

Light-Hearted List of Hazards Eases CICS Checkout

By G. Victoria Babish

Special to Computerworld

The following is a list I compiled of common - problems encountered with IBM's Customer Information Control System (CICS). I think the situations are examples of Murphy's Law applied to CICS-DOS/VS Version 1.1.1 operations.

Because the list is humorous, our team members laugh when they read it – but they do read it. The list is especially valuable because the mistakes have been made once or twice and not continually.

Here's the list:

1. If you think it takes five times to fix an idea firmly in your mind and you write MOVE TCAFCAAA TO TCTTEAR five times and then think when you write it in your program it will be the sixth time and you couldn't possibly make a mistake, you will leave out the crucial last A and bring down the system.

2. If you train yourself to always write TCAFCAAA, you will use that after a file control GET and have inexplicable data in your inquiry maps.

3. The program that worked fine with one record will use up all available core with 10 records because you forgot to release the area gotten for you by DFHFC.

4. If you always release core after DFHFC, you will release it after a GETNEXT and your next record will be placed in the supervisor and bring down the system.

5. The program that worked fine with one error condition will use up all available core with 10 error conditions because you forgot to release core used for error maps that were acquired with separate GETMAINS.

6. If you wrote three transactions and remembered to use large areas for large maps in all three and then write a quick transaction to test light pens, you will forget that small input will arrive in a small TIOA and use the small TIOA to return a wealth of data and bring down the system.

7. The program that worked fine with one terminal will use up all available core with 10 terminals because you forgot to specify no exclusive control and all records are awaiting updating.

8. The program that worked fine because you never did 10 of anything will cease working when system engineering reduces the virtual storage allocated to the production partition.

9. If you faithfully established addressability before each map use except in the obscure ease where someone entered a wrong response and then entered a PF key and then the enter key, the director will use your transaction to demonstrate how goofproof the system is and it will bring down the system.

10. If you are so used to writing BMS macros that you know the "no input" condition is tested with the MAPFAIL option and you always use the included versions of BMS error checking and one day in a hurry you code the macro with no branch to the CHECK routine, you will enter no data through the simple expedient of pressing the PF key and be in a loop and have to request the operator to cancel the partition.

11. If you always test your transaction with a simulator before putting it on the terminal, you will submit the job described above for an evening test and it will run the whole time someone is creating a Vsam data base and cause the file create to take three times longer than estimated.

Mix of Hipo Charts Leads to Confusion

By Joe Celko

Special to Computerworld

I have to disagree with Edward G. Yourdon in regard to IBM's "Hierarchy, plus Input, Process, Output" (Hipo) [CW, May 21]. I don't find it to be much of a documentation aid at all, thanks to some strong flaws in it and not because of how it's used.

First, there are two kinds of diagrams and they are read two different ways. You can have a horizontal chart with a lot of arrows crossing over each other, going to sub-subblocks. And then you can have a hierarchy chart that you read up and down instead of across.

Consider the first case of the horizontal block diagram. It has arrows of two different types to show two different flows of control.

The examples I saw of a Hipo chart in the U.S. Air Force series on structured programming should have been some of the best – they were done by IBM on a big important project that would have great visibility. But, frankly, they didn't show me anything at all – the English was easier to figure out.

The hierarchy charts are easier to read and could replace a Gant chart or Pert chart for program planning, but I ran into a problem with them – no control flow was shown at all.

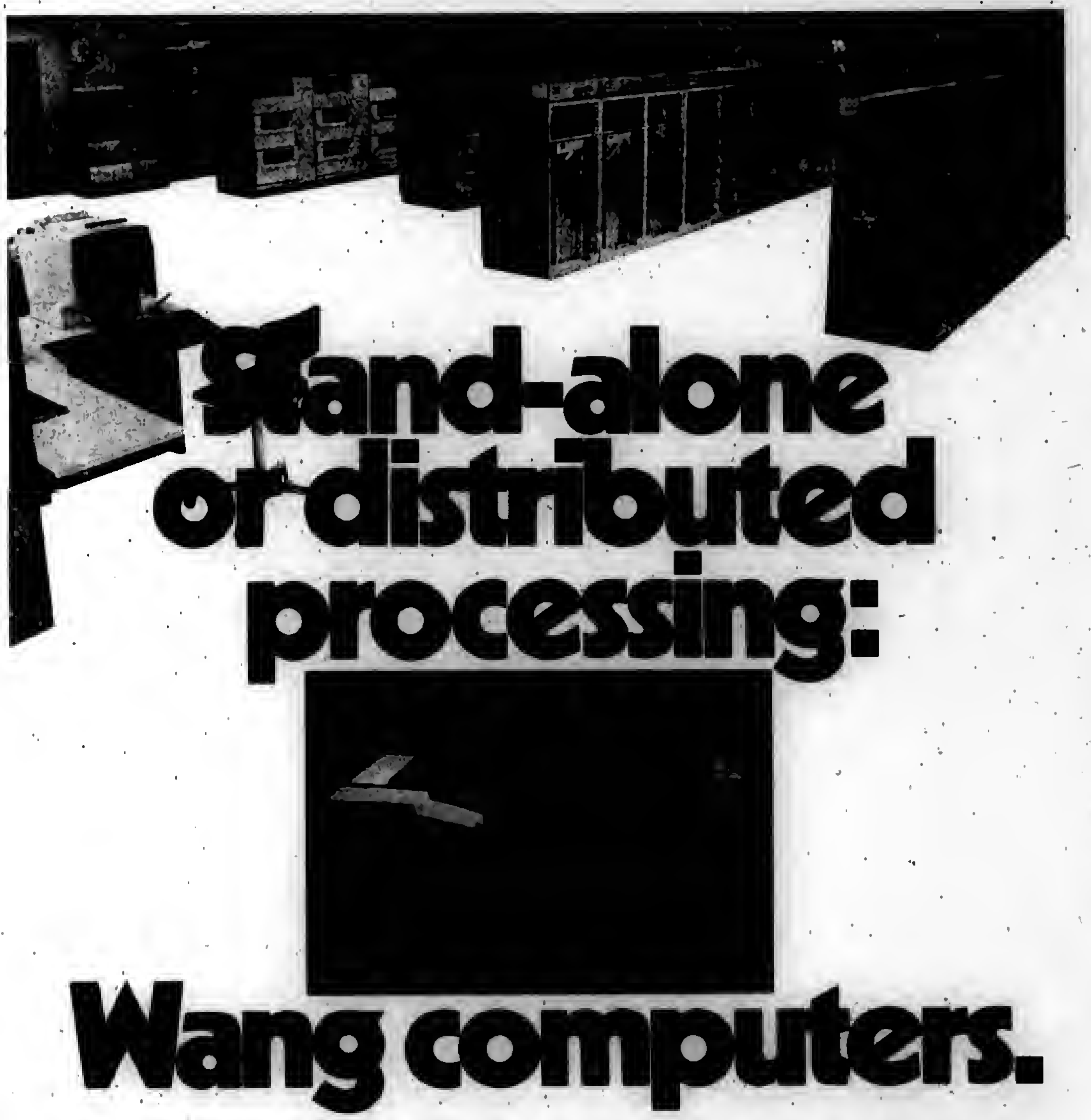
If, for example, we have Task A above tasks A^1 and A^2 in a chart, does A require both A^1 and A^2 or does it require either A^1 or A^2 to execute?

We don't know from this chart, and the IPO diagram cannot tell us either without getting a bit tricky in its process section.

The way I've seen this drawn is to have a box that edits the input to yield a valid record that goes to the guts of the process block or to add a block of "preprocessor" code to the hierarchy chart that explains tricky control.

I also don't like the idea of having two types of diagrams in the same system – it's called "the principle of least surprise." All it means is that you don't throw the reader any sudden changes in his visual input.

Please don't think that I am wildly happy about the Ansi flowchart system, which encourages GOTOs and lots of arrows jumping all over the place. Perhaps the final answer is in doing code so clear you don't need to draw a picture to explain it.



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Plan Increases Value of Measurement

By Barry A. Stevens

Special to Computerworld

Many installations have most of the basic elements of a complete performance measurement program in place. Usually, however, formal procedures do not exist to tie these elements into a workable plan.

Performance Evaluation

Such a plan would feed information to the several organizational groups responsible for performing the basic management tasks necessary to run the DP business.

These tasks – delivery of services, forecasting, resource planning and pricing, operational analysis and improvement, management reporting and user billing – require accurate, quantitative information describing the flow of work through DP.

The degree to which a measurement plan is tailored to meet the needs of these tasks determines in a large measure the effectiveness with which they are carried out and, ultimately, the effectiveness of the measurement plan itself.

While working with installations throughout the industry, it has become obvious to me that most of the elements of such an overall program are usually available.

Workload forecasting information is generally collected and used to estimate resource requirements for the forthcoming budget period. An equipment and staffing plan is prepared and, when resource plans are accurately known, a budget is prepared for the year; information is collected about resource use and is made available as needed during various types of analysis activities.

Data center service levels – the timeliness, accuracy, cost and reliability of data center processing – are observed and quantitative data describing these overall performance, and circulated to the rest of the organization as required.

Not Distinct Problems

Each of these activities is, however, usually treated as a separate and distinct problem. Data from a measurement program is very seldom used to guide the forecasting process; users are often asked to forecast their resource requirements in machine-oriented terms, such as elapsed processing hours or CPU or CRUs, with little guidance provided through measurement which could relate these somewhat esoteric units with more familiar application-dependent units such as checks, invoices or boxes of goods in a warehouse.

Data center service levels are often not taken into account when projecting capacity requirements. As a result, when workload increases, as predicted, and service levels degrade, as can be expected, there is shock and occasionally panic as performance improvements are sought on a crash basis.

Each area described above proceeds independently, as user and organizational pressures demand, profiting little from the information available to or produced by the others.

Generally, a one-day review of existing measuremnet practices at an installation by a qualified external observer is sufficient to highlight the good areas of existing practice and to identify opportunities for improvement.

Specific measurement activities and procedures can be suggested which, if implemented, build toward a complete set of information for the management tasks described above.

The external viewpoint is mandatory; often, installation personnel is tied up with immediate and pressing problems and has neither the time nor the inclination to step back and take the "big picture" view of operations. The time spent in such a review has been proven a good investment.

Stevens is an indendent consultant specializing in performance measurement and evaluation. He can be reached at 191 Mt. Airy Road, Basking Ridge, N.J. 07920.

More DBMS Advice

PENNSAUKEN, N.J. – An information service designed to assist administrators in installations working with data base management systems (DBMS) is now available from Auerbach Publishers.

Auerbach Data Base Management (ADBM), a single loose-leaf volume, covers the basic components of a data base environment, planning and design considerations, evaluation and selection of a DBMS and profiles of current offerings, Auerbach said.

There are separate sections on the data base administration function, the user-system interface and the data model and DBMS architecture as well as analyses of current trends.

An annual subscription, which includes bimonthly supplements of four to six reports, is available for $175, Auerbach said from 6560 N. Park Drive, Pennsauken, N.J. 08109.

Human Interaction Theme of Workshop

NEWTON, Mass. – "Human Communication in EDP Systems" is the title of a three-day workshop to be presented by Gerry Richardson of Richardson Associates, Los Angeles, at the Holiday Inn here June 21-23.

Sponsored by Ware Associates, the course is intended to teach participants to communicate productively with other people. Content of the three days will be of use primarily for systems analysts, systems team members and concerned users who want to improve their communications skills, Richardson said.

No Lectures

Although not a lecture seminar, the course will cover a series of topics ranging from preparation for productive communications and influencing others to be receptive to gathering accurate facts for decision making and user participation in systems improvements, the Ware announcement said.

Initial instruction, practice and individual coaching make up the learning format and enrollment is limited to 30 participants, the sponsor noted.

Sessions will begin at 9 a.m. and conclude in the "early evening" each day, Ware said. Cost of the course is $395 with discounts for multiple attendees from the same organization.

Ware Associates is at 38 Main St., Hudson, Mass. 01749.

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Cooperative Development of Software Seen Better Than Current Approaches

By Anthony C. Constable

Special to Computerworld

Almost everyone is familiar with one of the several graphs that depict total DP budgets over the last 10 to 15 years. The story these graphs tell is that as fast as the hardware dollar buys more, the software dollar buys less . . . and less . . . and less.

The whys of this situation seem at first glance to be easy to explain away – we have inflation to contend with, the latest technology to employ in order to remain in the mainstream and we have to automate more to remain competitive.

I agree with these reasons. However, if we look at the 10 largest banks, insurance companies, oil companies, etc., we find that, apart from names and locations, their products and services are almost identical.

When we look at the applications software for their computers, the similarity comes to an abrupt end, not because their hardware is different but because all of their internal idiosyncracies have been written into their software.

Is this a luxury for which large companies are willing to pay ad infinitum? I, for one, think not, and here is what I feel needs to be done.

'Revolution' Possible

The "canned" software package is here to stay – I have no argument there. However, software packages have almost without exception lagged behind technology due to the undercapitalized nature of the average canned software package vendor.

What is needed is a change of attitude and the birth of a new industry which I shall christen the "software cooperative." With this vehicle, the path will be laid for a new era in automation which we will retrospectively call "The Software Revolution."

In addition, the age of application software professionals will emerge to give us the general surge in business software development that has occurred in hardware development. Remember that most programmers are hacks!

How does the software cooperative work? Let us make the assumption that a software cooperative named International Business Software (IBS) is a thriving, dynamic company with a relatively fat order book. Let us further assume Mr. X, the top DP man for a large Fortune 500 company, is given the cost estimate for the rewrite of his company's personnel/payroll system, which amounts to a mere $2 million.

Mr. X has heard of IBS, but has never done business with it. He calls it in and explains his situation; IBS agrees to help him. This is what happens:

- For an initial fee of perhaps $20,000, IBS undertakes a meticulous search for companies with similar needs that may have put off such a rewrite because of the cost or are otherwise candidates for such a joint venture.
- If "mates" are found, then:
  1. A "common bond" contract is entered into by all participants ("n" heads may be "n" times better than one).
  2. The price will be geared to the individual participants; deviation from the norm in terms of special requirements and features would be extra, but would be significantly less than the cost for which any one of the participants could duplicate the product in-house.
  3. Participants would be entitled to royalties on sales made of software in which they had participated financially. This would encourage the adoption of new ideas.
- If no "mates" are found, then Mr. X has gambled 1% of his estimated total cost against a possible savings of maybe 70%, or $1.4 million!

Other Considerations

How does maintenance get handled? Here I think is the *coup de maitre* of the software cooperative. Maintenance would be conducted at the level required by all participants and the cost would be split equally (or equitably).

It is easy to see how much the reduction in in-house development costs, royalties and costs for continued maintenance and enhancements adds up to everyone involved.

Where is the development done? The development will be done centrally at the cooperative's home office, where the latest CPUs and software will be installed.

Project progress meetings, training and market research data will be available at the cooperative's facility, which will be designed to maximize creativity and efficiency. All of the latest techniques will be employed to produce systems and documentation that is second to none.

How do you convince people that cooperatively developed (and therefore, to some extent, standardized) business applications are viable? The answer is: with enough savings. While many may doubt this, I have been able to learn from top DP management that many companies are becoming "DP poor."

Where will it all stop? The computer utility will become a reality! Impossible, unlikely, unconstitutional. . .maybe, but does any company (apart from the utilities) provide their own telephone, electricity, gas or water systems? Of course not. But everyone uses them, not just because they are there but because there are no real cost-effective alternatives for the individual organizations and because they cannot do business without any of them.

How does the concept differ from canned software? Software that is canned is the most expensive software in the world and here is why: Someone has a good idea. Someone programs it. Someone sells it.

Thereafter, a staggering 80% of all revenue goes into marketing and very little very goes into continuing development.

There is a crying need today for all manner of software systems to handle problems such as automatic retrofitting for MVT programs in an MVS environment or measurement that prevents the initiation of job patterns that are unsociable.

Where are the vendors? They are still marketing Autoflow, Duo, Scert and numerous other Dodos that should have become extinct!

Could Become Reality

Since in this case this particular Muhammed has no particular interest in coming to you with such a proposition (you are a large and relatively conservative mountain when it comes to business software), perhaps you will bring the mountain to me in the form of questions, proposals, resumes and leads.

Please address the mountain to Anthony Constable, Constable Associates, Inc., P.O. Box 1227, Mendocino, Calif. 95460.

If the general indication is that my thoughts are echoed, I will do two things. First, I will write a follow-up article summarizing the responses I receive and secondly I will form IBS.

DEC Publishes 'Ideas'

NORTHBORO, Mass. – A publication titled *Index and Description of Educational Application Software (Ideas)* is now available from Digital Equipment Corporation.

The book describes more than 100 application packages for use on DEC systems and many other CPUs supporting Basic and Fortran programming languages, the company said.

Almost all packages are written in Dartmouth Basic, Fortran IV, or Basic-Plus (DEC's extended Basic). Each description includes information on source computer language, minimum educational level, ordering information and service charges or prices at press time, a spokesman noted.

Ideas costs $10 prepaid, including postage and handling, and can be ordered by requesting the *Ideas* book, Part EA 05857, from DEC, Communications Services NR2/M15, 444 Whitney St., Northboro, Mass. 01532.

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June 15	San Francisco (415) 885-1888
June 16	Vernon, Conn. (201) 871-3550
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One Year After Introduction

Decnet Architecture Operational on Over 40 Networks

By Ronald A. Frank
Of the CW Staff

MAYNARD, Mass. – One year after its introduction, the Decnet communications architecture from Digital Equipment Corp. is operational on more than 40 networks.

Although a few deadlines have slipped by several months, the implementation of Decnet essentially is proceeding as scheduled, according to Nathan Teichholtz, product manager for networks and communications at DEC.

Most of the Decnet networks in operation concentrate on interprocessor communications; the next big implementation phase will be to introduce terminal support to the communications architecture, Teichholtz said in a recent interview.

The link protocol called the Digital Data Communications Message Protocol (DDCMP) is operational in about 100 CPUs and is being used in such real-time applications as data acquisition and process control as well as time-sharing, he said.

One major addition to DDCMP is called DMC11, which Teichholtz described as a firmware version of the link protocol software. It provides synchronous transmission capability "to any DDCMP device" and down-line loading of remote unattended processors and operates at speeds up to 19.2 kbit/sec.

DMC11 supports most PDP-11 software including RSX-11D, -M and -S; RSTS/E; RT11; and IAS. Limited quantities of the firmware are now available for $2,145, he said.

The Network Services Protocol (NSP) layer of Decnet has thus far been supplied to users "in subset form" with only point-to-point routing capability. The future completed design will include a route-through packet-switching scheme to handle logical links, also known as virtual circuits, Teichholtz said.

NSP, when fully implemented, will handle network management functions including the routing of messages between networks as well as within individual networks.

DAP Layer

The Data Access Protocol (DAP) layer of Decnet was designed to tie into the operating system's resources – an "extremely complex" problem, Teichholtz said.

The currently implemented versions of DAP can share files, card readers and printers across nets. DAP can read and write complete remote files using a standard utility called PLE, which stands for Interprocessor File Exchange, Teichholtz said.

Other portions of Decnet already available include the DUP11 synchronous interface which supports the binary synchronous, IBM's Synchronous Data Link Control and DDCMP protocols. It costs $1,375.

The DV11 synchronous/asynchronous preprocessor is available in the synchronous version with the asynchronous version scheduled for release later this year. An eight-line synchronous version costs $3,410.

The DZ11 asynchronous multiplexer capability will be available this month; an eight-line version will cost $2,100.

Terminal Support Next

Up to now Decnet has not emphasized terminal support, and this will be the next important phase, Teichholtz said. Major enhancements planned are support for multidrop terminal nets, buffered terminals and remote concentrators, he added.

Within two years the architecture will include the capability to do multiplexing through software, he predicted.

DEC may also enter the hardware area with devices that "terminate terminals," but it is not possible to be more specific at this time, Teichholtz said.

User Sophistication Factor

Although there is confusion at present about the compatibility between the communications architecture of various vendors, Teichholtz said the user is too sophisticated to allow himself to be locked into any one network environment.

At present there is no compatibility between Decnet and the X-25 protocol standard recommended by CCITT, but there are nevertheless commonalities at the "functional level" between Decnet, IBM's Systems Network Architecture (SNA) and the X-25 recommendation, he said.

All layered protocols have common header structures for defining sources and destinations of messages and ways of submultiplexing physical channels into virtual channels, he said.

In Decnet, virtual channels are called logical links; in X-25 they are known as virtual circuits and in SNA they are known as sessions.

Despite the difference in terms, each is set up to handle two end objects as if they had a private line between them, he said.

The DEC goal over time is to make the user's program interface to all three protocols "as independent of the link as possible," he said. Eventually users will be able to run application programs using the same constructs with different protocols on each wire, he said.

The overall Decnet goal is to gain transparency for the user, he added.

Despite existing differences between vendors, it is doubtful any fundamentally different network architectures will be introduced in the near future, he said.

CIA Asks FCC to Reject SBS Application

WASHINGTON, D.C. – The Computer Industry Association (CIA) has filed a petition with the Federal Communications Commission (FCC) requesting a rejection of the domestic satellite application of Satellite Business Systems (SBS), a joint venture of IBM, Comsat General and Aetna Life.

The CIA petition claimed the application as submitted and amended by SBS still does not comply with FCC requirements.

In its filing, the CIA noted the SBS application failed to set forth detailed communications and equipment interconnection arrangements as ordered by the FCC. SBS' response regarding interconnection policies and practices was done "only in the most superficial manner," the CIA said.

The SBS application also failed to differentiate between communications interfaces – for which there exist established industry standards – and computer terminal and equipment standards, for which there exist no established standards, the CIA claimed.

"It is this lack of computer interface standards which has contributed to the rash of current antitrust litigations against IBM. Since it is IBM's participation in this venture that has caused the commission to issue the order requiring detailed interconnection arrangement disclosures in the first place, SBS must therefore abide by the commission's order," the CIA said.

Although SBS has admitted most existing terminal equipment will require some modification to effectively use satellite transmission, its failure to specify details gives IBM – the presumable developer of the system – a certain lead-time advantage over other equipment suppliers, according to the CIA.

"SBS' mere promise that interconnection arrangements will be offered through tariffs on nondiscriminatory terms and conditions is of little comfort to manufacturers who realize that interconnection charges for maintaining their equipment on IBM computers may be prohibitively expensive, though they may still be 'nondiscriminatory,'" the CIA told the FCC.

With regard to disclosure of computer interfaces, the CIA said SBS made no effort to provide information on those interfaces other than its general promise to make the system "compatible with as broad a spectrum of terminal equipment as possible."

The petition for rejection further noted that SBS has gone so far as to acknowledge IBM will have an advantage over other equipment manufacturers with regard to the modulation and access techniques the operational system will employ.

"It is imperative that a more specific explanation of access techniques, modulation types, CPU hardware and software interfaces and tariff estimates be offered by SBS before the application can be approved," the CIA filing said.

In addition to the CIA petition, about nine other companies have filed comments with the FCC. These include Western Union, RCA, AT&T and the Department of Justice.

SBS will have an opportunty to respond, after which the other companies can file reply comments. This proceeding should be completed by the end of June, although one of the parties may ask for a time extension.

The FCC Common Carrier Bureau staff will then make a recommendation to the FCC to accept the SBS filing with conditions or set the application for hearing. It is considered unlikely the application will be rejected outright, according to a staff source.

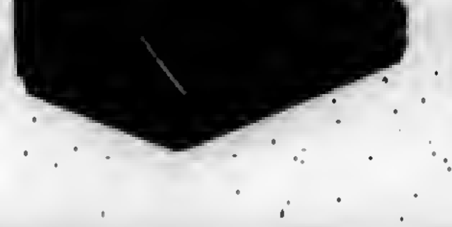
Media III Circuit Board Handles DG Users' Channels

ANAHEIM, Calif. – The Model 2804 from Media III offers Data General (DG) users a line printer controller, real-time clock, four asynchronous communications channels and an optional Teletype I/O port (or a fifth communications channel) on one printed circuit board.

Switches in each communications channel allow transmission rate selection in seven steps from 110- to 9,600 bit/sec.

The multiplexer channels are full-duplex, RS-232C standard (20ma current loop may be specified) and compatible with local terminals or Bell 103-type data sets.

The 2804 costs $2,850 and delivery is 30 days from Media III at 2259 Via Burton, Anaheim, Calif. 92086.



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Sycor Develops NCS for Model 350

ANN ARBOR, Mich. – Sycor has developed a network control system (NCS) for its Model 350 terminal which is said to allow the elimination of front-end processing and CPU support.

Users with large networks of terminals can take advantage of NCS auto-dial software to allow a central Model 350 acting as a master station to control data transmission to and reception from remote 350s without the need for an operator to dial the data set, a company spokesman said.

Once started, the automatic dialing software, operating unattended, is capable of dialing remote, unattended terminals and accomplishing device selection and address checking, he added.

As each communications task is attempted, a log is kept indicating its success or failure; recovery from incidents such as a busy signal can be specified by the operator during initiation of NCS, according to Sycor.

After attempting all specified communications, NCS scans the log for communications tasks which were not properly completed and automatically retries those tasks, the company said.

Designed also to operate as a secondary station in an unattended communications mode, a remote Model 350 can automatically answer an incoming data call and, in response to a control record from either a CPU or a 350 master station terminal, transmit indicated data files or receive data to indicated I/O devices, it added.

The unattended communications software can selectively print received data off-line after the phone line has been disconnected, Sycor said.

The Model 350, acting as a master station, uses 7- or 9-track 556-, 800- or 1,600 bit/in. magnetic tape as a data exchange medium between the terminal and the CPU.

Unattended Model 350 terminals reportedly can be dialed by the master station 350 or under direct CPU control using IBM 2770, 2780, 3770 or 3780 communicatins under Btam, Tcam, Power, Hasp or Grasp set up to transmit the required control record to the unattended terminal.

The NCS is included in the company's latest software release, Level D, for the Model 350.

Level D is available individually at $35 per diskette or in a two-diskette set for $50. It is presently available on the Model 350; NCS will be available Sept. 1 for the Sycor 440 clustered terminal processing system, Sycor said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

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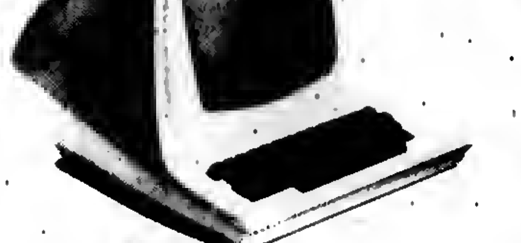

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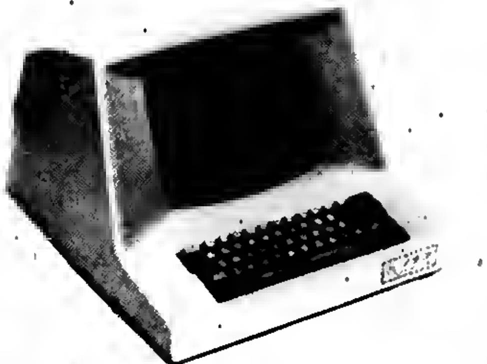

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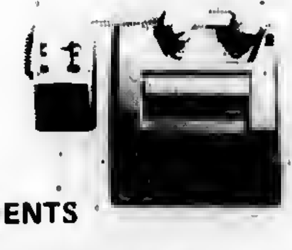

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Adage Has Two Units Which Can Emulate, Replace IBM 2250

BOSTON – Adage, Inc. has introduced the 2250 Model 3 and 2840 Model 2 emulator as a plug-to-plug replacement or addition to IBM 2250/3 interactive graphics configurations.

The Adage 2250/3 is based upon the earlier Adage GP/400 graphics peripheral, which has 300 nsec microprogrammed processor implementing the IBM 2250/3 graphics orders in firmware.

Terminal Transactions

A special GP/400 firmware package reportedly interprets and executes the IBM 2250/3 graphic orders "significantly faster" than the IBM 2250/3. Increased graphics order-processing speed and faster vector drawing speeds are said to allow the Adage 2250/3 user to display more complex screen images, flicker-free at 40 frame/sec.

The GP/400 performs all 2250/3 functions in native IBM 2250/3 graphics orders, the firm said.

The Adage 2840/2 replaces the IBM 2840/2 display control unit and provides for either local or remote (up to three miles) attachment to an IBM 360/370 multiplexer or selector channel.

The Adage 2840/2 contains a 32K-byte image buffer which stores graphic data for the Adage 2250/3 graphics console (up to four consoles may be attached).

Graphic orders from the 360 or 370 are stored directly in the appropriate buffer area and are fetched by the GP/400 for interpretation and execution, Adage said.

The Adage 2250/3 and 2840/2 provide local and remote operation at higher performance and require no IBM software conversion, according to the vendor. Single display console configurations begin at $72,200.

First deliveries are scheduled for August, Adage said from 1079 Commonwealth Ave., Boston, Mass. 02215.

Sweda 1560D Extends Media I/O of LA-36

PINE BROOK, N.J. – Sweda International OEM Products has announced the Roytron Model 1560D which it said expands the media I/O capability of the Digital Equipment Corp. LA-36 terminal.

The Model 1560D includes a photoelectric reader and a Roytron paper tape punch. The latter perforates conventional and special tapes including mylar and mylar composites, Sweda said.

The unit is cable-connected to existing connectors in the DEC printer.

The price of the Model 1560D is $1,995. Delivery is 90 days from Sweda at 34 Maple Ave., Pine Brook, N.J. 07058.

GE Agrees to Supply CRTs Made by Adds for Rentals

HAUPPAUGE, N.Y. – Applied Digital Data Systems, Inc. (Adds) has reached an agreement with General Electric (GE) under which GE will supply Adds CRTs under rental contracts ranging from one month to three years.

All rental contracts will include GE maintenance.

The terminals available from GE will include the Consul 520, 580, 920 and 980 plus the Envoy 620. Adds is at 100 Marcus Blvd., Hauppauge, N.Y. 11787.

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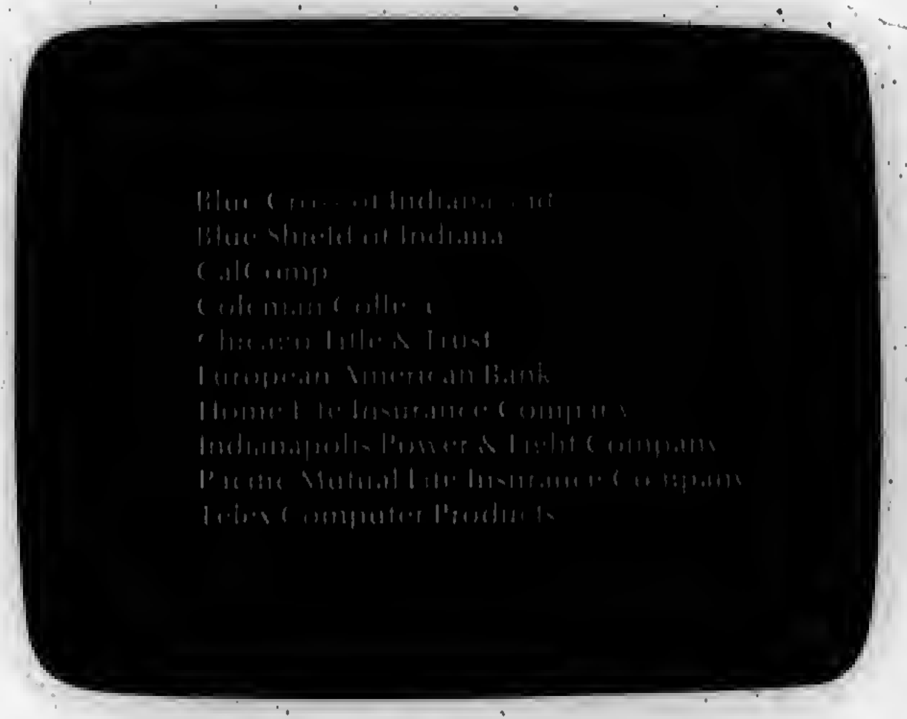

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Scanning System Helps Firm Get Messages Straight

NEW YORK – To improve mixed-language communications among Mitsui & Co. (U.S.A.) Inc.'s 185 offices in 77 countries and to and from its customers, the organization is using a computerized message-scanning system at its international headquarters here.

To the American secretaries of Mitsui's Japanese executives and to the operators of the transmitting terminals, Japanese messages that include German, French and code words and are spelled phonetically in English make practically no sense at all.

As a result, errors in typing, on punched paper tapc and in transmission of messages were common.

Now a Scan Optics 20-20 optical character recognition (OCR) system, incorporating a Hewlett-Packard (HP) 21MX minicomputer as its system controller, is fed the messages as typed by the executive, reads them at 65 char./sec and stores them on magnetic tape.

When the message is ready to be sent, punched paper tape is automatically produced by the scanner and placed directly into the transmitting machines, eliminating retyping and transmitter operators.

For Mitsui, messages are vital. Each business day, thousands flash electronically through the organization.

The Japanese written on the messages does not utilize Japanese characters, but instead uses the English alphabet spelled phonetically. All Japanese managers and executives have the facility to communicate in this manner.

Most typographical errors, prior to the installation of the scanner, were made by American secretaries because they did not comprehend the language and could not proofread their own work.

These messages would then be picked up several times a day for delivery to the communications room where they would wait, unless urgent, until a special crew of six part-time American transmitter operators would arrive to type the messages again, this time onto paper tape for use in the transmitting terminals.

It took about 22 people to handle the communications volume to and from New York, which amounts to 50,000 messages/mo. With the computerized scanning system, only six persons are necessary.

Biggest Advantage

The biggest advantage of the computerized system, according to William H. Gorham, Mitsui's assistant general manager for general affairs, is that it is less expensive to operate and it eliminates message errors.

"Time and money are saved substantially. Also, message traffic continues to climb, further justifying the use of the automated system," Gorham said.

Another advantage is that since there is less chance for typographical errors, message senders needn't say the same thing several times to avoid a costly misunderstanding.

This has led to more concise messages, saving time and costs of message sending, he noted.

According to Robert L. Brown, an attorney on Mitsui's administrative staff, there are other benefits: "We have reduced the net average time between the first typing of the wires and their actual transmission.

"Also, when individuals in the sales and administrative departments understood their messages would go out originally typed, they became more careful and less verbose."

System Operation

Messages are typed using a standard electric typewriter outfitted with a ball element having the OCR font.

More than 200 messages are placed in the hopper of the Scan Optics system; the start button is pushed, and the pages pass through the scanner.

Up to 60 page/min are processed depending on length and format of messages; up to 65 char./line can be read at the scanning speed of 2,000 char./sec.

After being scanned, the message travels electronically onto magnetic tape where it is temporarily stored. Typically, some 1,600 messages arrive here and 750 of them, ranging in length from a few lines to several pages, are sent out each business day.

With the messages filed on tape, it is possible to automatically perform several types of clerical functions. Messages can be sorted by destination, by sender's name, by originating department, by time, date or by any number of combinations depending on programming.

Global Network

Mitsui's worldwide communications network has more than 250,000 miles of leased lines and handles more than 20,000 message/day.

The network links domestic and foreign offices, subsidiaries and affiliates. Communications via satellite or cable between any two points, regardless of distance, can be accomplished in a few seconds, Mitsui said.

The Mitsui network is configured around three central points, each with a separate large mainframe computer to handle message distribution and switching.

These computers in New York, London and Tokyo interconnect offices in 124 cities around the world. The larger offices are connected by dedicated leased lines, while smaller ones utilize Tclex and telegraph networks.

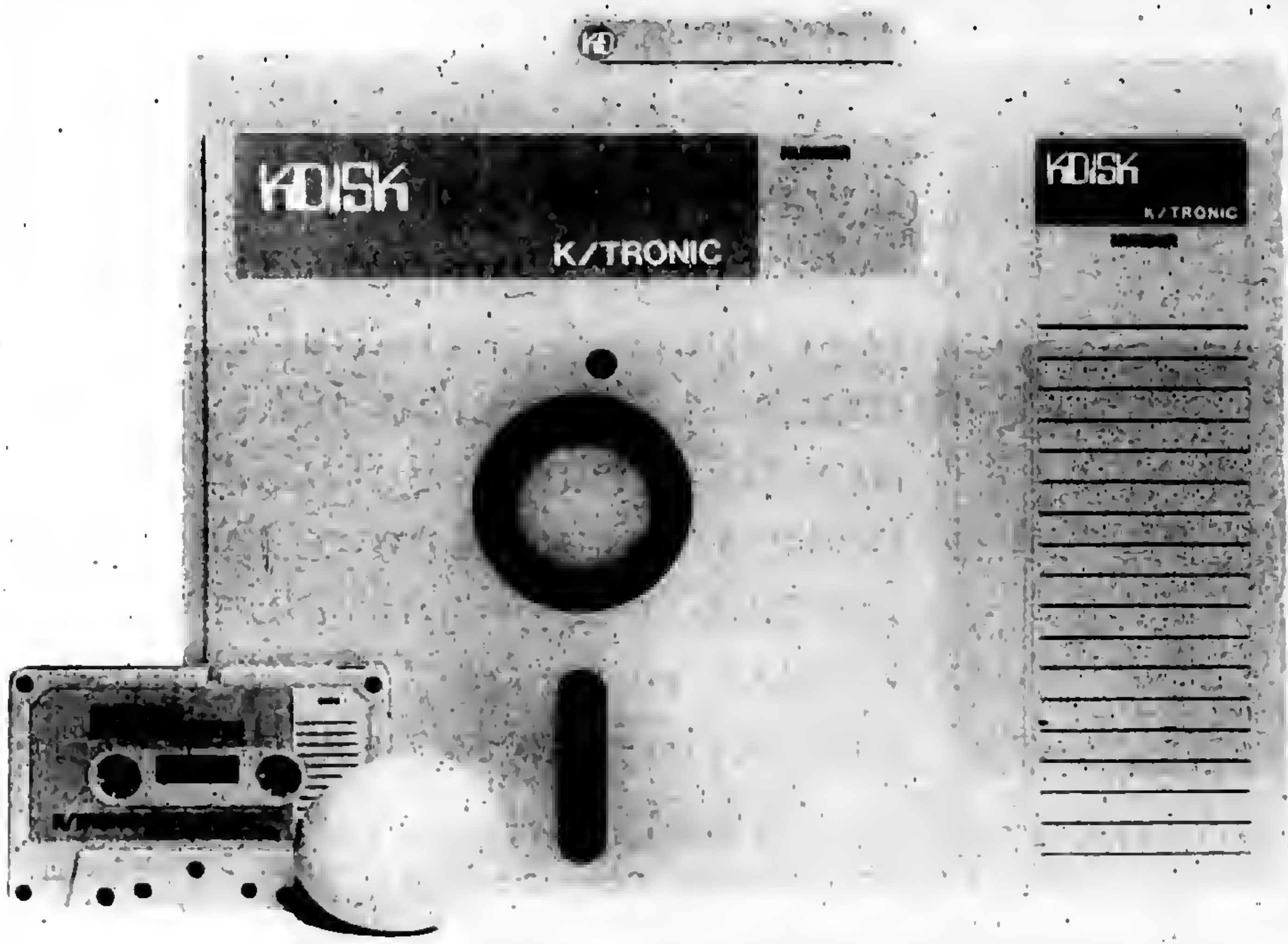
Nine Western Union Telex machines are used for communicating over dial-up lines to Canadian and U.S. customers. Five different makes of communictions terminals permit communications to customers all over the world.

Five additional transmitters are used to communicate within the Mitsui network. These connect to the New York computer, which houscs a store-and-forward message-processing system.

The time-shared CPU sends messages via the Tokyo and London computers at 2,400 bit/sec to multiple addresses after checking format and sending error messages if necessary.

Two transmission lines in the communications center here are arranged to receive these error messages, such as those for improper format, from the computer.

A switching patch board connected to a bank of 12 teleprinters is wired for monitoring all communications taking place elswhere in the communications network of the Americas. Twenty-two separate channels, including 10 between the New York and Tokyo computers, can be monitored in this way.



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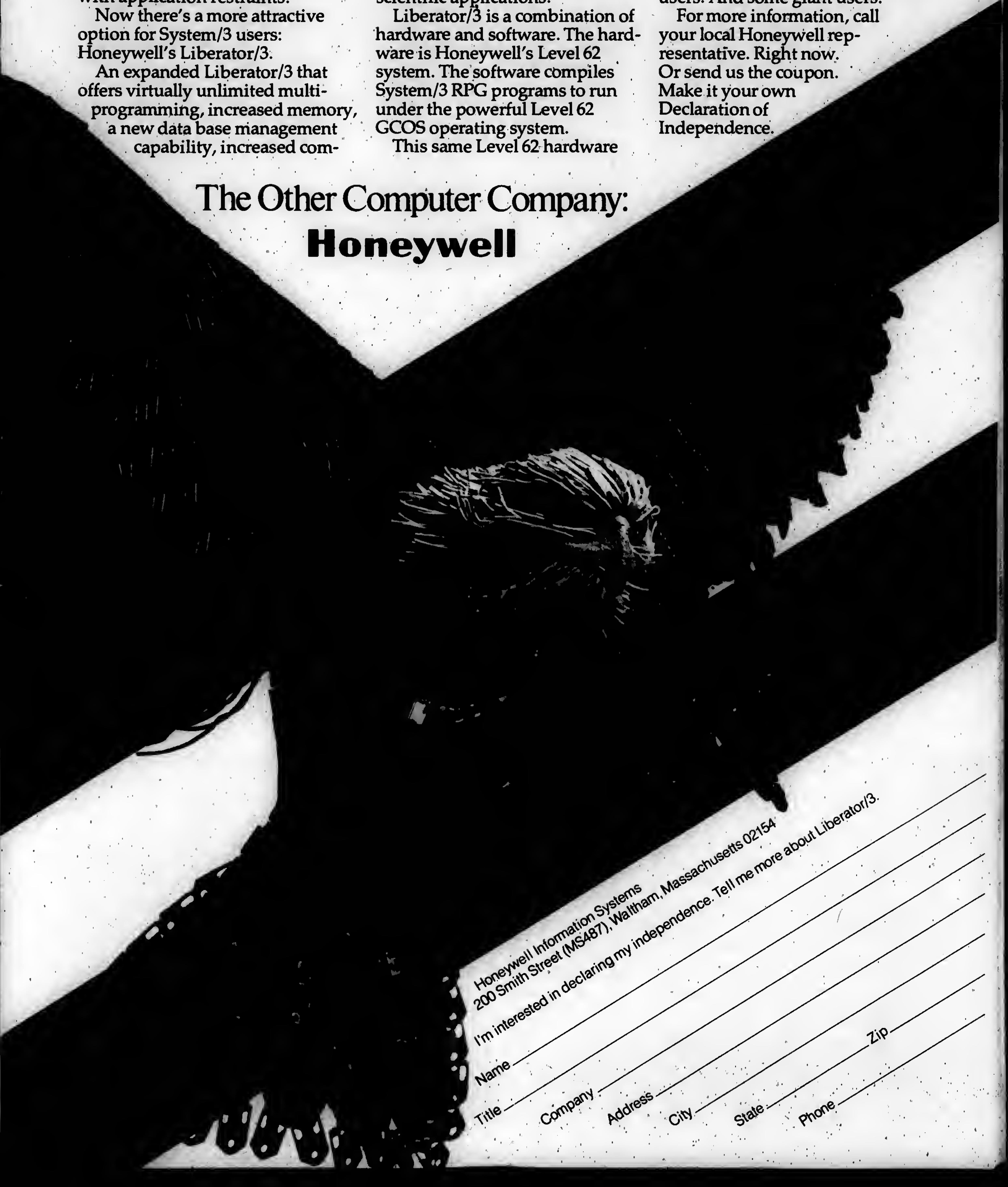

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Organized Around Five Categories

Phased-In MIS Helps NSF Hand Out $700 Million

WASHINGTON, D.C. – The National Science Foundation (NSF) is a small but uncommon U.S. government agency.

Established in 1950 to advance scientific progress by sponsoring scientific research, encouraging and supporting improvements in science education and fostering scientific exchange, the NSF awards some 12,000 grants worth about $700 million each year after evaluating roughly 25,000 proposals.

The computer system at NSF is also uncommon and has an uncommon name – Jason, which is not an acronym but the name of a legendary figure in Greek mythology.

NSF selected the name Jason, a spokesman said, to symbolize dedication, persistence and human interaction on a heroic scale; Jason represents all the hardware and software elements of NSF's management information system (MIS).

It is built on a large-scale, third-generation Honeywell 6060 computer with its Gcos operating system supervisory software and a specially designed subexecutive control element called Hermes, another name from Greek mythology.

Other elements include about 800 application programs, an integrated data base and a network of CRT terminals with slave printer attachments.

Jason was conceived in 1971 when NSF top management decided to design a new information system to meet the agency's needs into the 1980s. Officials envisioned a system that would support all major scientific and administrative operations from the processing of grant proposals to the processing of payroll.

The initial project planning, the requirements analysis phase and the specification writing phase were carried out in 1971 and 1972. Creation of the MIS on-line data base was one of the most complex project tasks – over 400,000 records of various types had to be created by reformatting and loading data from old computer systems and converting manual files, the spokesman said.

In 1974 a comprehensive MIS training program was begun as part of system implementation. Hundreds of employees were trained while NSF offices were eased into the system one by one.

The principal core subsystems were installed by mid-1975 and most parallel operations were suspended as the numerous expected and unexpected start-up problems were solved and the hundreds of modules stabilized.

The result of this intensive four-year program was a comprehensive system employing on-line interaction with the computer over a network of remote CRT terminals and involving an integrated on-line data base currently at about 350 million characters and scheduled to grow to about 500 million in the next 12- to 18 months.

Five System Categories

The MIS is organized around five broad system categories with each subsystem divided into other subsystems corresponding to particular NSF functions or activities.

Although the systems and subsystems are logically independent of each other, data is linked within the integrated data base. Information can be captured only once, at the appropriate point, and is shared by the various subsystems.

The Proposal Processing System supports proposal and application receipt, evaluation, approval, rejection and withdrawal. The focus of this system is on the program director and program manager.

The objective is to relieve administrative burdens while improving decision-making capabilities. The system makes heavy use of on-line capabilities and is composed of four subsystems handling specific responsibilities.

The Program Management System, made up of five subsystems, involves the maintenance of information on active grants and contracts, the creation of project management support records, data collection on government-owned property in the hands of contractors, maintenance of records of grant budgets and the fiscal status of awards and data to support the management of large-scale logistics operations.

The Administrative Operations System is divided into five subsystems to support line management in planning and executing program responsibilities and to provide housekeeping services to NSF organizations. Included are financial accounting, personnel, payroll, mailing list management and equipment inventory administration.

The Planning, Evaluation and Policy Studies System concerns itself with long-range planning, the evaluation of NSF programs and the conduct of studies in support of national science policy planning.

The Local Management System is a supplemental, on-line system providing generalized software to allow users to fulfill unique or one-time information needs that do not warrant inclusion within the main processing subsystems.

Subsystem features include arithmetic and mathematical routines, modeling and forecasting capabilities and software to create and manipulate special-purpose data bases.

On-Line Processing

NSF has adopted the concept that data should be captured at the source by people who know the subject matter best, the spokesman said, noting this is illustrated by the Proposal Processing System.

When proposals are received by NSF, they are processed by a unit called the Central Processing Section (CPS). In addition to handling clerical tasks such as the preparation of proposal folders, CPS captures most basic information about proposals including the title, amount requested, submitting institution and NSF organization and financial codes. This is done on-line in direct interaction with the computer.

CPS employees also check the NSF name file of grant project directors to see if the applicant ever received NSF support. If the applicant has dealt with the NSF previously, the new proposal data is added to his file; if not, a new record is created.

The proposal folder then goes to the responsible program officer. The program officer can use the Reviewer/Panelists Information Subsystem to help select the best scientists to help review the proposed work.

He can also look up the history of the applicant in the Principal Investigator/Project Director Information Subsystem.

(Continued on Page 40)

Data 100 Key-to-Diskette Model Designed for Low-Volume Sites

MINNETONKA, Minn. – Data 100 Corp. has introduced the Model 74-107 Keybatch/Diskette, a key-to-diskette version of its Keybatch data entry system designed for low-volume sites with concurrent data entry and remote batch requirements.

The system, which accommodates one or two local keystations, allows the user to enter, edit, verify and store source data on three diskettes.

The Model 74-107 is compatible with the larger versions of the Keybatch system, allowing the user to upgrade to full Keybatch capability by field replacement of the diskette drives with a cartridge disk drive, the firm said.

Speeds to 4,800 Bit/Sec

Keybatch/Diskette supports 150- to 1,250 char./sec card readers, 125- to 1,250 line/min printers, the firm said, with line speeds up to 4,800 bit/sec achievable in concurrent data entry and communications mode.

Speeds in excess of 4,800 bit/sec are application-dependent, it noted.

A configuration of the Keybatch controller, three diskette drives and adapter, one local keystation and synchronous communications costs $15,456, the firm said from 6110 Blue Circle Drive, Minnetonka, Minn. 55343.

Sycor Upgrades 440, 350 Units

ANN ARBOR, Mich. – Sycor has added 10M characters of fixed-disk storage to its Model 440 clustered terminal used for data entry and added two diskette units to the Model 350 intelligent terminal.

With the addition of fixed-disk storage, the capacity of the 440 system has been doubled from the previous high of 10M characters, Sycor said.

The single platter contains systems programs, user programs and data files in 512-character sectors; spare sectors for backup are automatically assigned and accessed, the firm said.

Seek time track-to-track is 10 msec with a maximum of 100 msec and an average of 70 msec.

A four-station 440 with a 10M-character disk, 64K bytes of memory, cassette interchange and communications leases for $816/mo on a three-year deal and $963/mo on a one-year lease. The purchase price is $29,270.

The additional 10M characters of storage adds $194/mo to the three-year lease and $230/mo to the one-year deal and carries a purchase price tag of $9,000. Deliveries are slated for December.

With the addition of the two diskettes to the Model 350, the unit can now have up to 1M characters of storage, double the previous capacity of the maximum configuration with only two diskette units. The maximum now is four such units, the firm said.

The two Model 350, including two integrated diskettes and 16K bytes of memory, leases for $292/mo on a one-year lease and $253/mo on a two-year lease, both including maintenance.

The dual diskette option adds $125/mo to the one-year lease price and $107/mo to the two-year lease. The purchase price of the option is $4,000.

Deliveries of the diskette units are expected to begin in October, the firm said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Why stick with a single source serial printer?

TALLY

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DP Dialogue

Notes and observations from IBM
which may prove of interest to
data processing professionals.

A Helping Hand for Public Assistance in Oklahoma

When a citizen of Oklahoma applies for public assistance with the proper documents, he or she may be in for a pleasant surprise. Even if the application involves multiple services, such as aid to dependent children, medical care or vocational training, a single interview with a caseworker may cover everything, with the appropriate specialist being called for more technical services. The applicant's eligibility for various services can be determined almost immediately and if assistance payments are involved, a check can be issued within 24 hours.

This fast, efficient service is based on the statewide information system of the Oklahoma Department of Institutions, Social and Rehabilitative Services (DISRS). The system operates under the Customer Information Control System (CICS), and links an IBM System/370 Model 158 computer in Oklahoma City to over 250 IBM 3270 visual display terminals. There is at least one terminal in each of Oklahoma's 77 counties. Through a common data base used by all of the public assistance programs, complete and up-to-date information on any case is swiftly accessible through any terminal, reducing the possibility for delay or conflicting data.

As Charles F. McDermott, comptroller of DISRS, points out, the system establishes both eligibility and non-eligibility with equal speed.

"Take aid to dependent children," he says. "Nationally, over 9% of all cases are found to be ineligible. Here in Oklahoma, the ineligible rate is down to 2%—one of the lowest in the nation—due almost entirely to our ability to cross-check through the information system. That reduction alone is saving the taxpayers of Oklahoma about $600,000 a month."

The system also makes it easier to coordinate public assistance grants with employment opportunities and work training programs. This has contributed to another record for Oklahoma—a higher percentage of people on public assistance are getting vocational rehabilitation than in any other state.

Before the information system was installed, a professional caseworker for the Department typically handled about 60 cases. Now, due to the dramatic savings in time and clerical work, a caseworker can oversee as many as 200 cases.

"The caseworker and the client both benefit from the system in improved morale and a greater sense of purpose," says McDermott. "And the individual who foots the bill—the taxpayer—has the satisfaction of knowing that the State's tax dollars are being spent more productively."

Yesterday a blacksmith, today a welder. Dempsey Faulkinberry learned a new skill with the help of Oklahoma's vocational rehabilitation program.

3890 Hits the Trail with Wells Fargo

Between 4 p.m. and 9 p.m. every evening, trucks from 11 regional offices of the Wells Fargo Bank drop off over two million checks and other documents to be sorted and handled at the bank's San Francisco headquarters. All the work must be completed by 11 p.m. the same night.

"Getting the checks from our own 300 branches in Northern California organized, logged and reconciled is a tremendous problem in logistics. Losing time can mean losing a lot of money in the banking business. The faster we can post our own demand deposit accounts and get credit on checks drawn on other banks, the faster we can reduce our float and use the additional money to earn profits," says Watson McKee Jr., senior vice president.

Wells Fargo is the 11th largest commercial bank in the nation.

"Since Wells Fargo began using IBM 3890 Document Processors last December, reconciling time, even on peak days, has been cut by two hours," adds McKee. "Now we can capture and sort over 100,000 magnetic ink encoded documents (MICR) per machine per hour—just about double the speed of our older IBM 2956 processors."

With improvements in multichannel character recognition and an extremely sensitive read head, the 3890 has cut the number of previously "unreadable" documents by 50%. It has helped Wells Fargo to lower its reject rate to 1.3%—less than half the national average for banking.

"Re-sorting rejected checks is traditionally the most expensive aspect of the entire document handling operation because it has to be done manually," explains McKee. "The 3890's will save us a considerable amount of money in that area alone."

Equally important, the 3890 provides a full audit trail for every transaction. After reading the MICR code, the 3890 prints a unique item number on the back of each document. It imprints the bank's endorsement legend on the checks, transmits the MICR code and the item number to one of the bank's two System/370 Model 168 computers. It also makes a microfilm of each document for future reference.

After capturing, numbering and endorsing the documents, the 3890 sorts them according to the bank, branch and type of account to which they belong. In addition to checks, documents such as deposit slips, loan payments, master charge receipts and Christmas Club payments are also processed.

Advanced Features

Among the advanced features of the 3890 are a built-in jogger which automatically aligns the documents and a new document separator which virtually eliminates the "piggy-back" problem—two checks sticking together.

With a total capacity of 36 pockets, available in modules of six pockets, the 3890 can grow to meet the needs of almost any operation. Wells Fargo now has eight 3890's, each equipped with 30 pockets, to handle all the work from its branches in Northern California.

Final conversion to the 3890 was accomplished in a little over two weeks—about a month ahead of schedule. According to Mike Macpherson, group manager in charge of installation, "We did nine months of extensive testing and then gradually added offline applications. Moving to online sorting was virtually transparent to our users."

"We've already realized considerable benefits from the 3890," says McKee. "And as new applications come on, such as cycle sorting, we expect the processor to help us save even more money in the future."

At Wells Fargo Bank, operators work with one of eight IBM 3890 Document Processors. Each machine can read and sort over 2,000 MICR encoded documents a minute.

Advertisement

Teaching the Language of the Deaf with Interactive Computing

Using interactive computing, a student at Golden West College learns the symbol for "drive" in Ameslan, a sign language for the deaf.

A student at Golden West College in Huntington Beach, California, is using a computer terminal to study a picture. The image she is looking at represents the word "drive" in Ameslan, the American Sign Language of the deaf, used throughout North America.

Over 200 students, most of whom have normal hearing but are interested in communicating with the deaf, are enrolled in Golden West's sign language courses which use computer-assisted instruction programs. The programs include 49 separate lessons which introduce 660 signs corresponding to frequently used words or phrases.

"We see interactive computing as a very powerful and integral component of coordinated instructional systems which also include the traditional classroom and other non-traditional learning activities," says Richard L. Mercer, supervisor of computer services at the college. "Using computer-based practice, simulation and other programs, students can add to their knowledge and improve their skills at their own pace and at their own time—almost as if each has a private tutor."

By typing in the English word or phrase at the terminal, the student activates a microfiche file linked to an IBM System/370 Model 155-II at the Coast Community College District's computing facility. A drawing showing how to make the appropriate Ameslan sign for that word flashes on the screen within seconds. The system can also be used in reverse so that the student can test himself.

"We have found student reaction to computer-assisted instruction overwhelmingly positive," says Paul M. Culton, chairman of the impaired hearing program. "It makes learning fun. And it also serves to correct misconceptions on the spot, instead of next week in class."

The college has over 1,000 learning programs in 55 different disciplines ranging from Ameslan to more traditional subjects like history, science and mathematics. All of the programs were developed using A Programming Language (APL). According to Bob Schaulis, director, information services for the Coast Community College District, "We believe that personal computing—giving many people simple access to the full power of the computer—will become increasingly important in many areas of instruction."

North Central Airline Lands $7 Million Saving

As one of North Central Airline's DC-9s lands at midnight in Minneapolis, aircraft mechanics are ready in the hangar with a list of parts to be tested, checked and possibly replaced. Within three or four hours, the necessary inspections and repairs are completed and the plane is in the air again taking passengers to Chicago, Milwaukee, Detroit or any one of the 90 cities served by the regional carrier.

The rapid "mini" overhaul is possible because North Central developed a series of unique computer programs to avoid more costly total overhauls, which can keep a plane grounded for days, instead of hours. Called SCEPTRE—System Computerized for Economical Performance, Tracking, Recording and Evaluation—the programs were developed using structured programming, a technique that required 30% less time than the previous method. They access a data base controlled by IBM's Information Management Systems (IMS) which includes a complete maintenance history of each of the carrier's fleet of 50 DC-9s and Convair 580s.

"We're a regional airline, and our profits really depend on keeping all our planes fully utilized," says John Pennington, SCEPTRE project administrator. "With SCEPTRE, we can schedule maintenance time so effectively, it's like having an extra DC-9 in our fleet. That's a $7 million savings right there."

Information such as aircraft performance history and parts inventory and replacement forecasts is stored on an IBM computer at North Central's corporate headquarters in Minneapolis. Using the SCEPTRE programs, a mechanic, pilot, or executive can check on the maintenance status of any plane from any one of 45 IBM 3277 and 3275 Display Stations located in North Central's hangars, machine shops and parts storage areas. The SCEPTRE files can also be accessed through IBM reservation terminals located in airports throughout North Central's system.

"SCEPTRE helps us spot potential problems long before they occur," says Clive Schuelin, systems manager. "The initial justification of SCEPTRE was based on the expectation that by the time the system is completely operational, it will reduce the existing maintenance budget by 10%. With development well underway, we've already received significant dollar benefits."

Aircraft mechanics service a DC-9 at North Central's maintenance center in Minneapolis. An online IBM computer system helps make the operation faster and more accurate.

Computer Helps Weston "Get It Out The Door" Faster

When you've got 100 highly complex subassemblies in production on any given day, an hour of lost time can mean meeting or missing a shipping deadline. At Weston Components, an affiliate of Schlumberger, Ltd. at Archbald, Pennsylvania, an IBM computer is helping make every hour count by reducing the paper workload and increasing the controls over work in progress.

"We need very accurate knowledge not only of our inventories and purchasing requirements, but also of the exact status of each job," says Mario Dell'Aglio, director of operations. "A great deal of our business is 'job shop' kind of contracts—specialized components made to order. That means we have to figure out new production scheduling, parts requirements and budgets to fit each new assignment."

To help keep track of orders in various stages of completion, Weston uses several IBM programs which run on the company's System/370 Model 115 virtual storage computer. A data base management program creates and maintains basic information files describing product structures and the manufacturing procedures associated with each product.

"We've used the program very successfully to organize our bills of materials—the lists of parts used in each assembly," says Jack Minelli, Weston's systems engineer. "By automatically generating purchase requisitions for each job, it has reduced our clerical work by 30%. Equally important, it allows us to find out how many of the same parts may be needed on several different jobs, thus saving us money through volume buying."

Shop Floor Control is one of several IBM programs used to report on the status of work in progress at Weston Components.

The program insures that up-to-date information relating to costs, parts availability and inventory can be made available to all the departments that may need it. Since data is only entered once for inclusion in a master file, the chances for errors are minimized.

During the past year, Weston computerized another critical aspect of its business—following the progress of a work order at every stage during production. The job is now being done with the help of the IBM Shop Floor Control Program.

"Now we can keep much better track of the manufacturing process and establish priorities for work assignments," says Dell'Aglio. "In addition to getting job status reports daily, instead of weekly, the program helps us identify the total time spent at each work station.

"The system provides for the preprogramming of jobs so that the most efficient work sequence, due dates and priorities are followed."

Both program products aim at the same goal—organizing the manufacturing process so that situations like bottlenecks, material shortages and scheduling conflicts can be spotted and corrected immediately.

"By taking the paperwork burden off our foremen, we can free them for the really important work—planning to optimize the use of our machines and men and avoid costly disruptions of the work flow," says Dell'Aglio. "And the more precisely we know where we stand on work in the shop, the more responsive we can be to our customers' demands."

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

IBM.
Data Processing Division

In Handling Variety of Clients

Upgrade Gives Supplier Improved Service Response

PARSIPPANY, N.J. – Graco, Inc., an international manufacturer and supplier of fluid handling and finishing equipment, has improved its customer service response capability through the installation of a computerized customer order processing and inventory monitoring system.

Installation of this system represents an upgrade of Graco's existing computerized order entry system which has been operational for approximately two years, Graco said.

Six Mohawk Data Sciences Crop. (MDS) 2300 terminals have been added to Graco's computer communications network with the primary objective of reducing the time required for customer order processing.

The MDS 2300s, which have been installed in Graco's U.S. branch facilities, are used for order writing, entry of inventory transactions and the feedback of order status and inventory information for domestic operations. The system stores order information on disk files, then catalogs it for subsequent transmission to and processing by the Minneapolis-based host computer.

Timely Order Processing

"Graco customers like our ability to get their orders into our order processing system the same day we receive them at any of our branch offices, according to Robert Giesen, distribution systems manager at Minneapolis.

"Although we do not stock our entire product line in branch warehouses, we are assured the customer's order for a specific product will be entered on our Minneapolis order-processing system within 12 hours. If the item is in Minneapolis stock, the customer's order will be processed by our master distribution center in Minneapolis the morning after it is received," he said.

"We serve a variety of customers, large and small," Stan Yocum, manager of Graco's information systems, added. "To meet our customer-service objectives, it is imperative that we provide on-the-spot, intelligent order entry capability. One customer order might be for a critical repair part; the next might be from a large Graco industrial distributor or from one of the major U.S. auto plants.

"We have selected the MDS 2300 terminal system to satisfy this wide range of requests on a timely basis," Yocum continued. "Once an order has been received by the host computer, the MDS units provide timely feedback to the local branches on order status at the Minneapolis distribution center right up to the time the order is actually shipped. This approach provides Graco customers the optimum in customer order processing efficiency."

Method Monitors Motor Circuits In DP-Based Plant

TULSA, Okla. – Ford Motor Co. engineers have developed a method for monitoring motor circuits in a computer-controlled plant here.

Tied directly into an IBM 1800 computer, a network of electrically isolated current sensors manufactured by American Aerospace Controls, Inc. monitors 164 motor circuits to protect the critical production process.

These sensors were selected by Ford engineers not only because they are electrically isolated from the motor circuits (the current-carrying cables pass through holes in the sensors), but also because the sensor output voltages, in the 0 to 5 Vdc range, are compatible with computer interface circuitry, a spokesman said.

"They permit the computer to monitor the current being drawn by motors throughout this facility so that, in the event any motor should start to malfunction in any way, the resultant increase or decrease in current from the norm would be sensed almost immediately, analyzed by the computer and operating personnel would have ample time to identify and correct the incipient failure," according to R.A. Cushing, Ford supervisor of automation and controls.

The application of current sensing to motors in a manufacturing facility is particularly appropriate because of the variable and critical control requirements which are reflected in motor current variations, Cushing said.

The sensors proved to be the simplest and most practical solution because no excitation voltage is required, connection to the power cable is unnecessary and the dc output signal is directly compatible with computer input circuit, he added.

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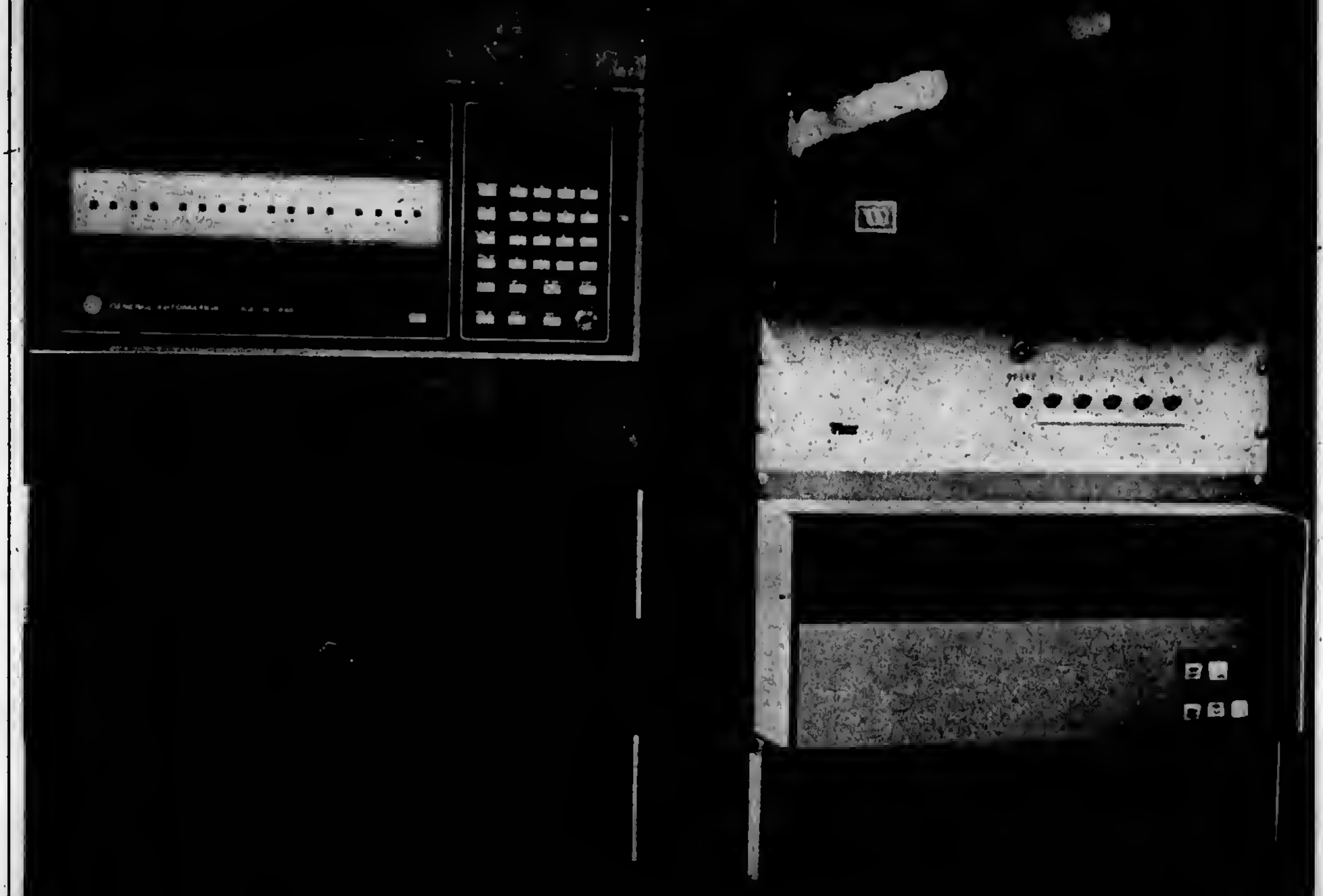

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DATA COMMUNICATIONS SWITCHING SYSTEMS

News Distributor Solves Credit Problem With Systems

E. BRUNSWICK, N.J. – The New Brunswick News Dealer, a distributor of magazines and newspapers here, said it solved a long-standing problem in handling the crediting of magazine "returns" from the retail outlets it services by installing two intelligent distributed data entry systems.

The units have virtually eliminated the errors and uncertainties that plagued the previous method of handling credits for magazine returns, according to Bill McNamara, New Brunswick's general manager.

The problem, he noted is one shared by nearly all magazine distributors throughout the U.S. – that is, how to ensure proper crediting of returns of particular publications by particular dealers and other outlets and the corresponding adjustment of publisher accounts.

Two operators working the Datapoint Corp. Diskette 1100 units handle the entire load of return credits for New Brunswick, which distributes some 45 newspapers and 2,000 magazines. These magazines run the gamut from distinguished news weeklies to comic books and from how-to-books to detective magazines; returns can range as high as 70% for certain categories of books.

Dealers are credited for all returns and publishers reimburse the distributor; it's up to the distributor to make sure that the crediting is handled accurately; McNamara said.

Through master files maintained in disk storage on New Brunswick's IBM 3 computer, information is contained on all 300 dealers and outlets it services and on the magazines sent to each one.

The IBM 3 files are periodically updated by information received from the Diskette 1100 units, which provide reports on the relative efficiency of retail outlets, comparative information on how the various publications are moving in each of these outlets and, concurrently, develop sales histories for order regulation.

Credit Where Credit Due

In handling returns, the important thing is to make sure the credit is given to the right dealer and the proper publication is indicated, McNamara said. Uslng the keyboard of the Diskette 1100, operators enter the basic information on returns, such as the dealer identification number, the date of return, the "Bipad" number – a unique 5-digit identifying number for each publication, the date of issue and, finally, the quantity of magazines returned. All this information is displayed on the screen.

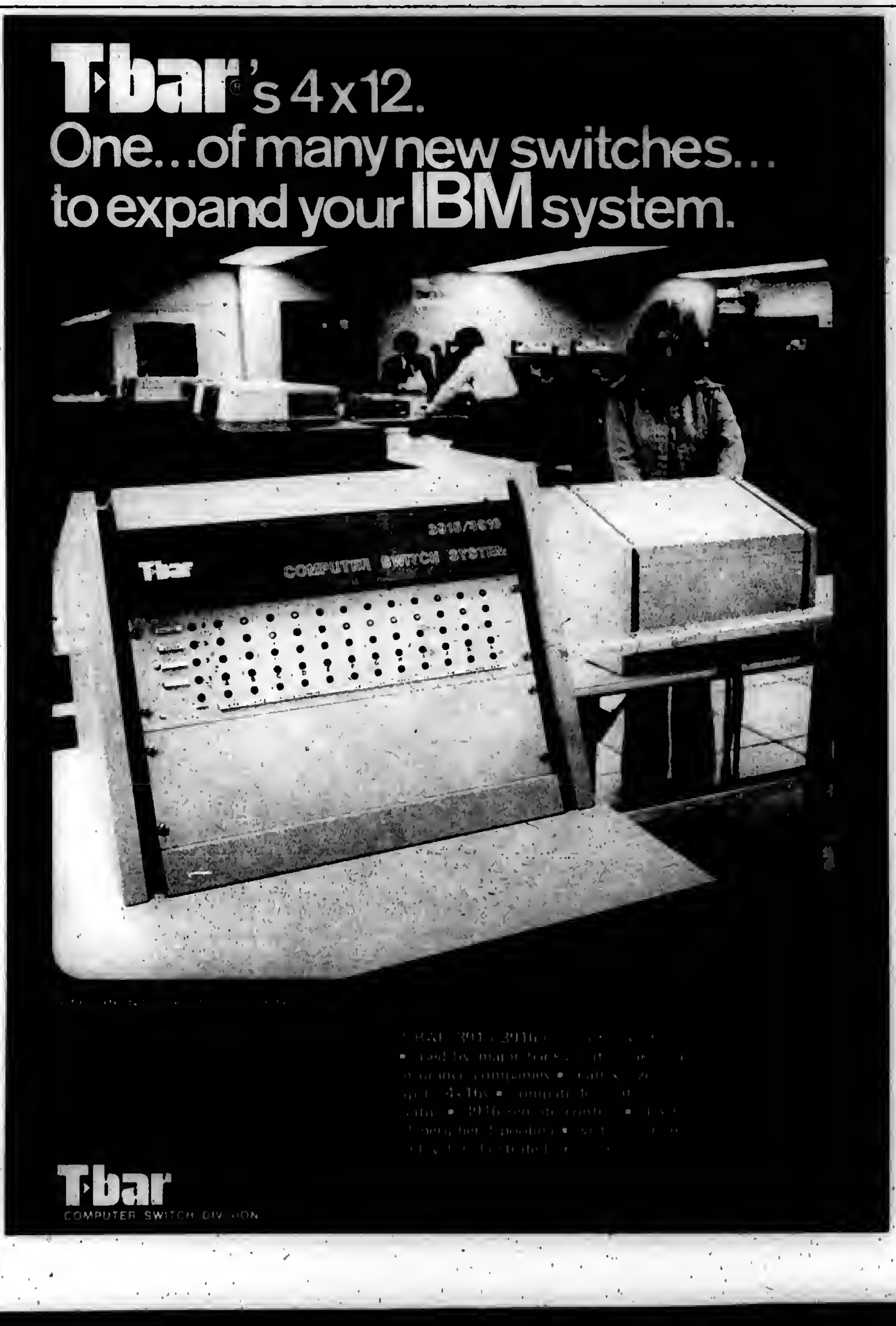
Further, when the dealer number and the Bipad number are displayed, they are accompanied by the actual name of the dealer and the actual name of the publication which the operator can visually scan to make sure he's on the right track.

"Lack of such a visual scan in the past was what complicated the job of handling returns and led to errors and discrepancies in accounts with delaers and publications," McNamara noted. "With the Diskette 1100 units and their display screens, we've eliminated 95% of the problem."

The operator makes a physical count of the returns that are set in boxes near the unit and then enters the data in the appropriate spaces in the format displayed on the screen. Should an invalid dealer number of Bipad number be inadvertently entered, the unit is to lock automatically.

The system is further designed to inform the operator if a magazine is a "premature" return (an active, resalable magazine.) These magazines are not destroyed, but saved and redistributed to retail outlets.

It is important that accurate information on returns be entered at this point, McNamara said, since immediately thereafter the returns are shredded and disposed of (except for prematures) – in other words, the source documents for the data are destroyed.



MIS Eases NSF Work Of Handling Grants

(Continued from Page 36)

Also, any errors in proposal data the program staff finds can be changed online immediately.

If the program officer decides to turn down the application, he sends this recommendation to his division director. If the division director concurs, a division employee enters the declination information into the system on-line.

Of fundamental importance to NSF's MIS is the integrated data base concept. In its data base design, NSF cmploys a modified version of Honeywell's Integrated Data Store (IDS) file organization technique.

In IDS files, data is strung out in chains with records linked together by pointers stored within each record. The use of IDS permits the linkage of related files into a truly integrated data base, the spokesman said.

These chains can be "walked" from different entry points. For example, the same proposal data base can be searched via a "client institution" chain, an "NSF organization" chain or a "field of science classification" chain.

Application programs that access the MIS integrated data base use NSF's Extended Programming Language (XPL). XPL is a modified version of Honeywell's IDS/Cobol language, extended to overcome certain technical limitations of Honeywell's IDS and to support on-line processing capabilities.

The Honeywell 6060 computer system includes a central processor with 384K words of memory, a Datanet 355 front-end network processor, 13 disk drives, 10 tape drives, two line printers, card reader and card punch.

NSF also has an off-line tape-to-print computer printing system capable of printing about 4,000 line/min.

The MIS employs a network of 65 CRT terminals, distributed throughout NSF headquarters and modified for security purposes to permit the transmission of full pages of data rather than one line at a time. About half of the terminals have slave printers attached to them that provide hard-copy printouts of data appearing on the CRT screens.

Data transmission is via Bell 202S dial modems and 202T private line modems at a transmission rate of 1,200 bit/sec over standard voice-greade telephone lines. Acoustical couplers are also available.

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Gcos Release Announced

HIS Extends Memory, Adds Peripherals to Level 62

WALTHAM, Mass. – Honeywell Information Systems (HIS) has announced enhancements to the Series 60 Level 62 minicomputer that include an increase in main memory; additional peripherals; a release of Gcos with extended multiprogramming, data management and communications features; and a Fortran compiler, the firm said.

The enhancements place the 62 somewhere between the IBM 3 and 370, in multiprogramming and communications capabilities, HIS said.

The 4K-bit MOS main memory announced for the system allows the Model 62/40's memory to be increased from 98K to a maximum of 131K bytes, twice that available on the IBM 3/12, Honeywell claimed.

The 262K-byte maximum main memory for the 62/60 doubles the previous maximum, the firm said. The MOS memory will be shipped in the first quarter, it added.

A disk controller with a 1.2M byte/sec transfer rate was also announced for delivery in the third quarter.

An optional scientific instruction set and a standard decimal-to-binary conversion instruction also will be available in the third quarter, HIS said.

Communications capabilities will be improved by "more than doubling" the number of communications lines permitted on either a Model 62/40 or 62/60, HIS said. A second integrated communications controller permitting up to five more lines in addition to the basic four lines and the console line will be available in the third quarter for $48/mo on a five-year lease, or $2,200 if purchased, the firm noted.

Gcos Enhancements

Multiprogramming capabilities have been extended in a release (RO300) of Level 62 Gcos to allow almost any combination of simultaneous batch and communications jobs concurrent with output writer, HIS said.

Also available in the third quarter, Release 0300 provides for a Fortran language processor; Cobol; RPG; communications; utilities and operator control features; and improvements in resource, data and job management, HIS said.

Dynamic memory management, including compaction of unused space between programs and file-sharing control through the job control language, will contribute to Level 62 multiprogramming efficiency, HIS said.

Configuration of cardless systems will be possible under Release 0300, HIS said.

Other data management features include improved sequential file processing and indexed record insertion, the firm said.

A 28K Fortran compiler, a superset of ANS-75 Level 1, will be available for a license fee of $113/mo, HIS said. Enhancements to the Cobol and RPG compilers also will be provided, it noted.

A binary synchronous communications supervisor that operates with either switched or leased lines will permit a Level 62 central processor to communicate directly with an IBM 360 or 370 processor. License to use the binary synchronous communications (BSC) supervisor for connection to host processors will be $131/mo.

However, the maximum monthly charge for using any combination of multiple communications supervisors, including previously announced products for asynchronous and synchronous terminals, remains at $131, HIS said.

Basic utility and sort/merge packages also will be enhanced, the firm said. A communications support utility, available at a $10/mo license fee and required for use with the BSC supervisor for processor-to-processor communications, also will be available in the third quarter, HIS said.

A binary synchronous communications supervisor for communication with an IBM 3741 diskette terminal and a 3741 support utility will be available during the first quarter with Release 0400. License fee for each package will be $10/mo, HIS said.

Peripheral enhancements include a high-speed disk storage module; 300 card/min and 500 card/min, 80-column-card table-top card readers and addressing features

(Continued on Page 42)

Mini Improves Engineers' Turnaround

By Esther Surden
Of the CW Staff

MINNEAPOLIS, Minn. – A grain engineering firm here is handling data faster and has improved turnaround time with its minicomputer.

T.E. Ibberson Co. has been in the business of constructing grain elevators, feed mills and grain-related facilities since 1881. The firm builds the plants that mix raw grain products with chemicals and minerals to produce cattle feed and poultry feed and operates throughout the U.S., Robert W. Hart, secretary/treasurer for the firm, said.

The company's Burroughs Corp. B700 was installed at the firm's headquarters here last January, Hart said.

"We had Burroughs equipment since about 1947 with a succession of various machines and they handled our work very well. In addition, we've had excellent service in the Minneapolis area, and I believe the service factor is very important for a computer," Hart said.

The firm "looked at some demonstrations on IBM," but that was the only other company it considered, Hart said. The Burroughs system was lower in price as well, he noted.

Prior to the installation of the B700, Ibberson was using two Burroughs E6000 systems, which Burroughs describes as a marriage between the electronic accounting machine and the computer. The models at the company had punched card I/O and a magnetic stripe ledger card option, Hart said.

The B700 configuration at Ibberson today includes a 32K processor, two 2.4M-byte disk drives, a line printer and system console. It cost "in excess of $50,000," Hart said.

Several Applications

The firm is running a number of applications on the system. Programming was developed by a local software firm. "We directed them rather closely," Hart said.

Payroll is one of the most complicated applications on the B700, he said. The system keeps track of between 180 and 200 employees scattered in about 10 states and computes all the various state taxes that must be withheld.

During some pay periods some employees may work in more than one state, further complicating the payroll problem.

Cost Distribution System

Accounts receivable, accounts payable and employee history files are all on the system. The firm calculates an insurance premium from the job cost distribution application and distributes both material and labor costs according to a specially devised code system. The cost distribution system is current within four days after the work week closes, Hart said.

The company also generates the monthly Workman's Compensation and public liability premiums from the system.

An equipment reporting system, in effect an inventory and costing device, allows the company to determine the cost of its used quipment and relate it to the job cost, he said.

A sophisticated job analysis gives the progress of each job at any given point in time, Hart noted.

"Certainly speed was one of the major factors that caused us to make the switch in the first place, and it's bearing out," Hart concluded. The firm is pleased with the faster turnaround time and faster handling of data available with the B700. The faster handling of additional data that we couldn't generate from our E6000" was another benefit, he said.

Prime Has Memory, Disk Subsystem

NEW YORK – Prime Computer, Inc. announced both a 256K-byte MOS memory board and a 300M-byte disk subsystem for its 400 CPU at the National Computer Conference here last week.

The memory board is based on 16K-bit memory chips and offers a capacity four times greater than Prime's 64K-byte memory board using 4K chips, the firm said.

The memory features a standard error-correcting code (ECC) which adds a special 5-bit code to all data stored in memory. Used in conjunction with checking firmware, the code automatically detects and corrects all single-bit errors without interrupting CPU activity, the firm said.

The code corrects most multiple-bit errors as well, Prime said.

The memory board costs $35,000 with initial deliveries determined on a "system-by-system basis" until the chips are available in sufficient quantities from Intel, the major supplier, the firm said.

The 300M-byte disk subsystem includes a disk drive, 12-platter removable disk pack and controller. Up to three more drives can be added to the subsystem for a maximum capacity per controller of 1.2G bytes, Prime

The Primos operating system supports two controllers for a combined maximum on-line disk capacity of 2.4G, the firm noted.

An error-correction feature for the subsystem is implemented via a combination of hardware and system software, Prime said. The feature allows automatic correction of up to 11 bits in any one burst error, the firm said.

The disk plus controller costs $49,000. Additional disk drives cost $41,000 each. Deliveries will take place in the first quarter. Prime is at 145 Pennsylvania Ave., Framingham, Mass. 01701.

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Also Used to Educate

Mini Performs Administrative Functions at College

By Esther Surden
Of the CW Staff

SANTA ROSA, Calif. – The minicomputer in the data processing department of Santa Rosa Junior College here performs both the administrative and educational functions for the school, according to Paul Petersen, director of data processing for the school.

The Hewlett-Packard (HP) 3000 system was purchased as an upgrade to an IBM 360/20 which, while it supported the administrative efforts, "wasn't very good for the students," Joseph Waters, a data processing instructor at the school, said.

The school considered adding a faster card reader to upgrade the system, but the 20 wouldn't support it, and the college would have had to go with a larger CPU.

It then considered Honeywell machines and the IBM 360/30 and 360/135. During this time, some of the instructors decided it would be nice to have a system that would support both time-sharing and batch. At that time HP announced the 3000, Waters said.

The people who were evaluating systems liked the HP 3000 specifications right away, but had heard "horror stories about how it crashed" every five minutes and decided at first not to obtain it.

Santa Rosa then considered the possibility of getting dual systems, one for the administration and one for the students. During this time the school evaluated the whole cross-section of what was available, Waters said.

HP then came back into the picture because by this time the bugs were worked out of the 3000 system, Waters said, and "I chose to reconsider."

Formal bids went out with two kinds of specifications listed, one for a combined time-sharing-batch system and another for separate systems. IBM did not bid; Honeywell bid but was too expensive, Waters said.

The system was bought on a one-year lease and, at the end of the lease, the college had the option to purchase or return the system. It cost in excess of $200,000, Waters said.

Conversion to the 3000 from the IBM system was simpler than expected, Waters said, and, after the year, a committee to evaluate the system recommended the college keep the system.

The configuration at the college includes a CPU with 128K bytes of memory, two disks with 47M bytes each, an HP 4905 swapping disk, one 7-track 800 bit/in. tape drive, a 600 line/min printer, a 200 line/min printer, two 600 card/min readers, a system console and a 16-port multiplexer for time-sharing, Waters said.

The college also has a "mixed bag" of other terminals, including Digital Equipment Corp. Decwriters.

The biggest problem is the system really needs more memory to be effective, Waters said, but HP has said more memory will be available for the system soon, he added. "We've grown far more rapidly than we anticipated," he said.

The system is used by the math and chemistry departments for instructional purposes. The math department uses it for working in Fortran.

In the chemistry department a student may be issued an unknown quantity with the record of what it is kept in a file on the system. As the student works out his problem, the system will give back the correct answer.

Also the computer can generate a hypothetical situation with random values for the student to work through.

In addition, an excess of 300 people enrolled in data processing courses have access to the machine, Waters said. Scheduling is open ended, with no formal lab periods, and this so far has worked very well, he continued.

Most of the administrative functions carried out on the mini come from the registrar's office, Waters said. These include the registration of students, the add/drop procedure and a census which is taken somewhere in the middle of the term. The census is a report to the student of his status in a particular class and allows a professor to drop a student who has never shown up for class.

State and federal reports and reports of program budgeting are also produced by the system, Waters said.

Memory, Peripherals, Added to Level 62

(Continued from Page 41)

that allow attachment of some previously announced Series 60 devices to the models 62/40 and 62/60, HIS said.

An 80M-byte mass storage unit, the MSU0330, uses a high-speed disk controller to increase the I/O transfer rate from 312 kbyte/sec (with the MSU-310) to a maximum of 1.2M byte/sec. It also increases the maximum Level 62 system transfer rate from 837 kbyte/sec to 1.6M byte/sec, HIS claimed.

Up to two disk units, or a maximum of 160M bytes, can be attached to any 4K MOS memory 62/40, the firm said. Up to six units, or 480M bytes, may be configured with a 62/60 HIS said.

The MSU0330 mass storage unit will be available in the third quarter for a monthly rental fee of $386 on a five-year contract or for $15,700 per unit, it noted.

The 80-column-card tabletop card readers that operate at 300 card/min or 500 card/min will be available in the fourth quarter. The 300 card/min version can be rented on a five-year contract for $162/mo or purchased for $4,305.

The units can be upgraded at the customer site to 500 card/min readers which can be leased on a five-year contract for $205 or purchased for $7,560. HIS or IBM-mode operational mark sense features may be rented for $117 on a five-year contract or purchased for $4,305, HIS said.

In addition, the 1,200 line/min and 1,600 line/min printers previously available on Level 64 and 66 systems will be available in the second quarter for the 62/60. HIS is at Waltham, Mass. 02150.

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Total Automation Planned

Denver Mini Monitors Movements in Water System

DENVER – Minicomputers in this mile-high city are helping to solve Denver's unusual water problems.

Lacking a major water supply, the city not only faces conservation of a sparse 13 inches of annual rainfall, but copes with a singular distribution situation.

Every day, 500 million gallons of water plummet down the steep slopes of the Rockies through 1,700 miles of conduits and mains to Denver homes and businesses. Pressure must be delicately balanced to avoid too much pressure in some lower areas and too little in hillside neighborhoods.

Using minicomputers, the Denver Water Board is taking gradual steps toward total automation that will eventually regulate water flow, measure purity and schedule filter bed flushing.

The board's first step was installation of a Digital Equipment Corp. PDP-11/45 RSX-11D system to monitor the water depth in 11 mountain reservoirs, the rate of flow from the reservoirs through conduits ranging in size from 2- to 90 inches in and out of four filter plants and the pressure exerted at 39 pump stations.

Monitoring Consolidated

Monitoring, once done in four chartrooms at various locations, is now consolidated in a single room so one operator can determine the status of every part of the system using one terminal.

From this room, the operator can request the present status – updated every 60 sec – of any element of the system or minute-by-minute performance for the previous two hours.

Data at 15-min intervals for the previous 48 hours also remains on-line so enough information is available for the operator to decide whether valves should be opened or shut off.

The water system has room to store 250 million gallons of treated water. The remaining 250 million gallons is treated on the same day it is used, so the system works most of the time at full capacity with 50,000 tons of water moving through the pipes at any one time.

In the summer, Denver residents use 80% of their water for lawn irrigation. This means a sudden localized rain storm dumping lots of water on an area can result in a shutoff of sprinkler systems that could produce pressure buddups and ruptures along the system unless valves are adjusted quickly but gradually, the user said.

To accomplish this automatically, the Denver Water Board has developed a computer model of the system. The board plans to put historical demand data and weather information on-line so the computer can predict water usage.

By doing so, the board hopes to minimize the need for pumping to the point that savings in electricity will pay for the computer hardware. The board also anticipates this regulated flow will reduce maintenance costs because there will be less wear and tear on pipes and fittings.

While the first PDP-11/45 is regulating water distribution, a second RSX-11D system is being phased in to monitor the purification process at the filter plants. In the future, computers will control the rate of flow of raw water in treatment plants, test the water for clarity, direct it to a filter bed and test it for fluoride, chlorine and PH content to see which chemical must be adjusted.

The first 11/45 system supports eight terminals and has 96K of memory, disk, a line printer and magnetic tape. The mini being phased in has 56K of memory, magnetic tape and two disk drives and supports a CRT and two printers, according to Philip Richardson of the water board.

The total equipment cost was about $400,000, he said.

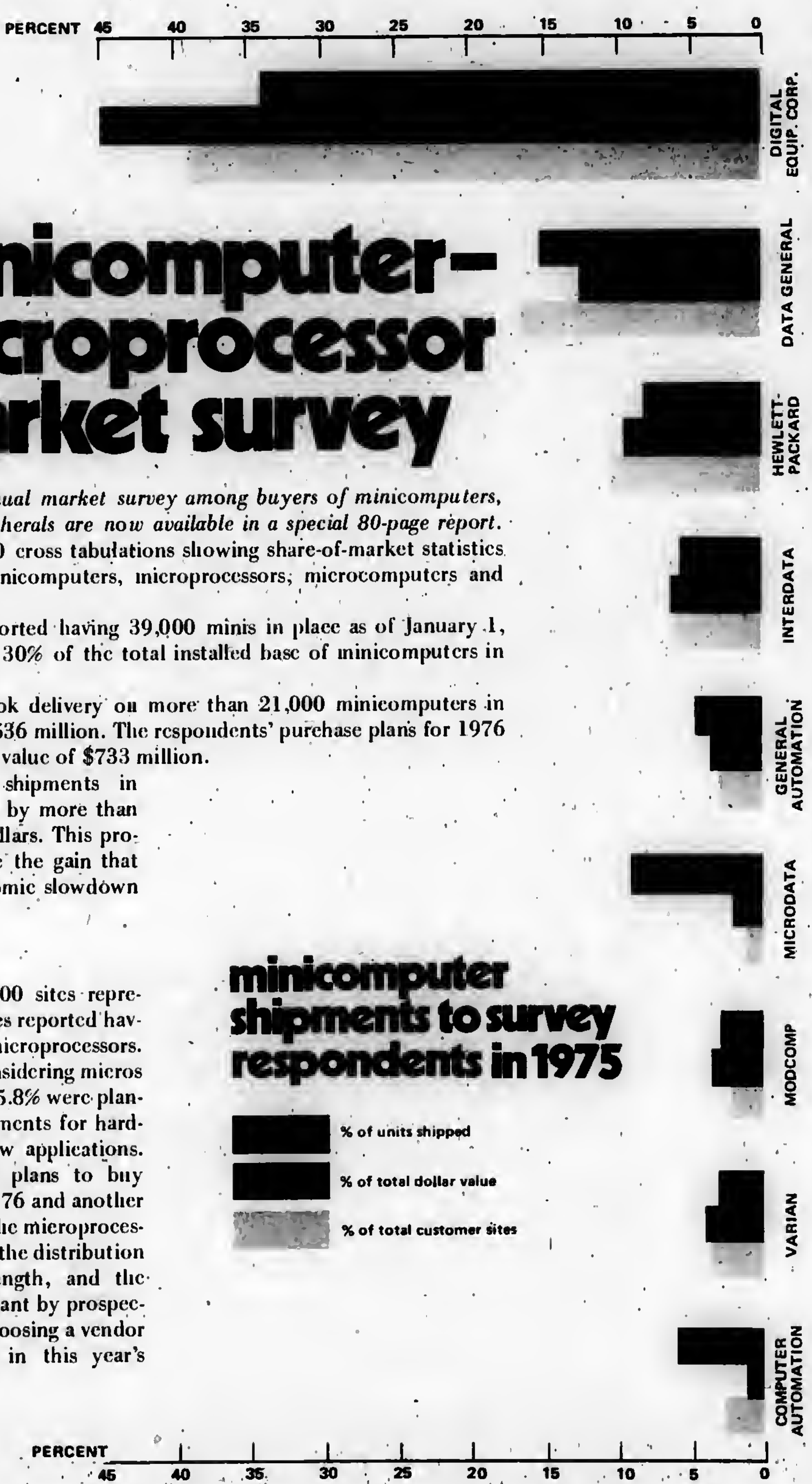
DEC Word Processor Built Around PDP-8/A

MAYNARD, Mass. – The WS-100 is Digital Equipment Corp.'s latest offering in its word-processing line.

The system was designed for users who do not require data processing in the same system as word processing, DEC said.

Built around DEC's PDP-8A mini, the WS-100 has a CRT for text editing and a letter-quality printer that can operate at up to 540 word/min. More than 100 pages of text can be stored on one floppy, the vendor said.

The WS-100 costs $19,800. An asynchronous Ascii communications line interface which permits the system to communicate with other systems is available for $1,500. DEC is in Maynard, Mass. 01754.



announcing
1976 minicomputer–microprocessor market survey

The results of the fifth annual market survey among buyers of minicomputers, microprocessors and miniperipherals are now available in a special 80-page report.

The report features over 60 cross tabulations showing share-of-market statistics for all major vendors of minicomputers, microprocessors, microcomputers and miniperipherals.

The survey participants reported having 39,000 minis in place as of January 1, 1976 – accounting for nearly 30% of the total installed base of minicomputers in North America.

The survey respondents took delivery on more than 21,000 minicomputers in 1975 at a reported value of $536 million. The respondents' purchase plans for 1976 include 28,000 minis at a total value of $733 million.

Worldwide minicomputer shipments in 1976 are projected to increase by more than 30% in terms of units and dollars. This projected growth is nearly double the gain that was achieved during the economic slowdown of 1975.

MICROPROCESSORS

Nearly one-half of the 5,700 sites represented among the survey replies reported having an active interest in microprocessors. About 8.3% of these were considering micros as substitutes for minis while 35.8% were planning to use micros as replacements for hardwired logic or for entirely new applications.

The respondents reported plans to buy 362,000 microprocessors in 1976 and another 576,000 (up 59%) in 1977. The microprocessor vendors being considered, the distribution by application and word length, and the factors considered most important by prospective buyers of micros when choosing a vendor are tabulated and analyzed in this year's survey report.

Micro Products

Processors, Memories Among 19 Offerings From NEC

LEXINGTON, Mass. – NEC Microcomputers, Inc. has expanded its line of microcomputer products with two Intel 8080A-type CPUs, seven memory products, two controllers and eight support chips.

The processors are the UPD8080A-2, a 2.5-mHz device, and the UPD8080A-1, a 3-mHz device.

The memory products include the UPD458D, a 28-pin electrically erasable programmable read-only memory (Eprom) organized 1K- by 8 bits with a 450 nsec maximum access time.

The random-access memories (RAM) announced included the UPD2102ALC family of 16-pin 1K- by 1-bit static NMOS units with separate data I/O and access times of 250-, 350- and 450 nsec and the UPD2101ALC family of 22-pin 256- by 4-bit static NMOS devices with separate data/I/O and access times of 250-, 350- and 450 nsecs, pin compatible with UPD5101C-E CMOS RAM.

NEC added the UPD2111ALC family of 18-pin 256- by 4-bit static NMOS devices with common data I/O and access times of 250-, 350- and 450 nsec and the UPD5101C-E, a 22-pin 256- by 4-bit static CMOS device with separate data I/O and access time of 1,000 nsec.

The controllers include the UPD371D, an 8-bit bus-compatible controller which handles up to two magnetic tape cassette drives in an 8080A microcomputer system and the UPD372D, a flexible disk controller that is compatible with IBM 3740 flexible disk drives and controls up to four drive units in an 8080A microcomputer system, the company said.

The support chips announced the UPB8224D, a 16-pin single-chip clock generator and driver; the UPB8228D/38D, a 24-pin system controller and bus driver; and the UPD8251C, a 28-pin universal synchronous/asynchronous receiver-transmitter.

In addition, the company has the UPD8255C, a 40-pin programmable parallel I/O port; the UPB8214D, a 24-pin priority interrupt control unit; the UPB8212D, an 8-bit I/O port; and the UPB8216D, a 4-bit bidirectional bus driver.

Price of the UPD8080A-2 processor is $27.30 and the UPD8080A-1 sells for $35.

The NEC Eprom is scheduled for delivery in the third quarter and has not yet been priced.

The UPD2102ALC with 250 nsec access time sells for $5.20; the 350 nsec model for $4.60 and the 450 nsec model for $3.25.

The UPD5101C-E CMOS RAM is $9.35. The other two, as well as the controllers, are scheduled for delivery in the third quarter and have not yet been priced.

The UPB8212D I/O port costs $4.12 and the UPB8216D is $2.88.

The other support chips also will be priced sometime close to their third quarter delivery date.

All prices are for 100-unit quantities, NEC said from 5 Militia Drive, Lexington, Mass. 02173.

System From ETC Based on 6502

HAWTHORNE, Calif. – Electronic Tool Co. (ETC) has a microcomputer system, based on the MOS Technology 6502, which is intended for system development, control and small-scale data processing applications, the firm said.

The ETC-1000 comes with a 40-key keyboard, programmable 8-digit display, I/O interfaces, power supply and memory, the firm said.

The keyboard for control and data entry includes a full set of data entry keys as well as system function keys.

The ETC-1000 has a direct I/O system with eight latched output lines and eight latched input lines which can, under program control, operate external devices. A two-level hardware interrupt system is standard, ETC added.

The CPU includes the 6502, clocks, control logic, interface buffers, 1K of random access memory and 256 bytes of read-only memory containing system control functions, the firm said.

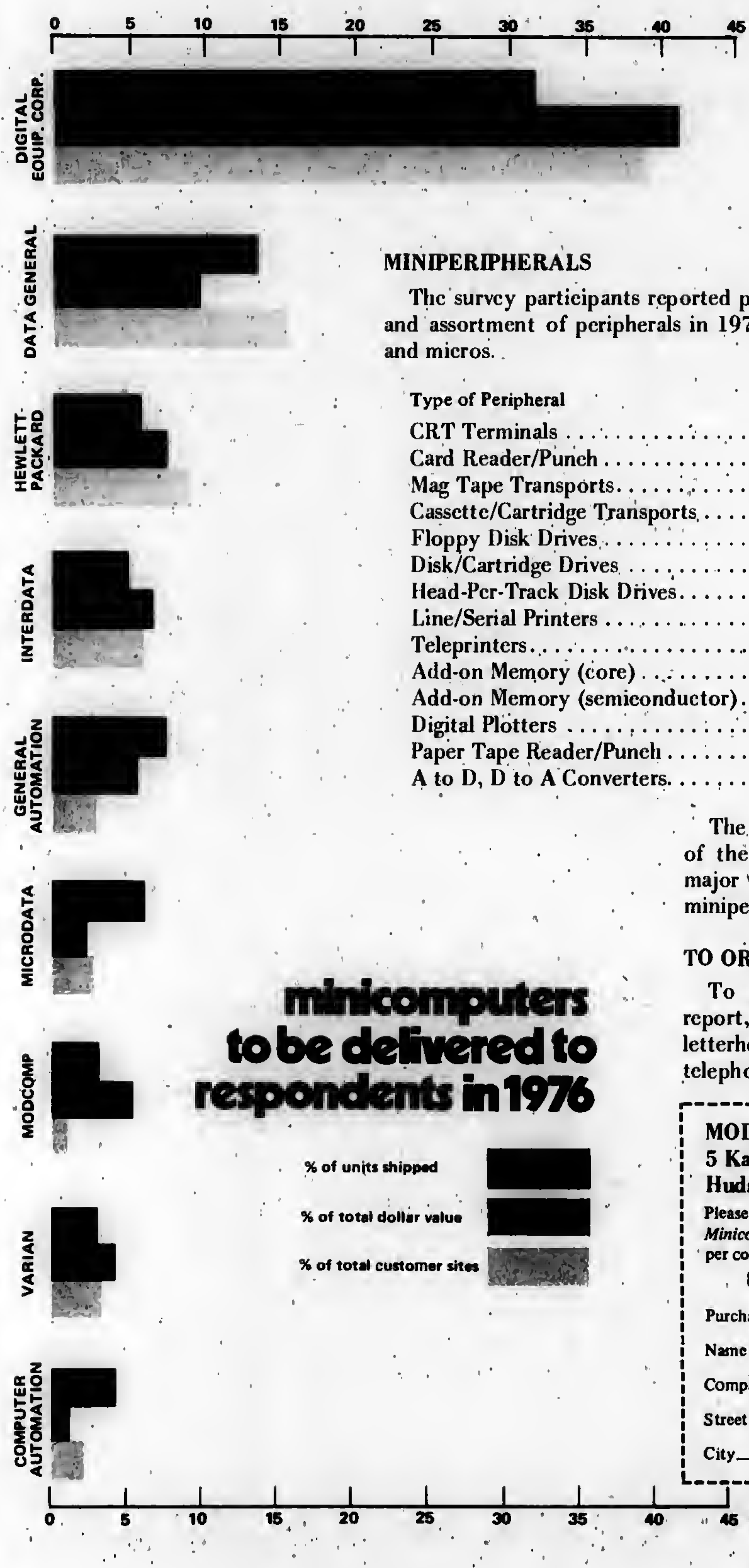
A complete system costs $675. ETC is at 4736 W. El Segundo Blvd., Hawthrone, Calif. 90250.

Firmware for 8080 Available From REI

VAN NUYS, Calif. – Recognition Systems, Inc. (REI) has high-speed, floating-point firmware for the Intel 8080 microprocessor, the vendor said.

With 16-bit mantissa and seven-bit characteristic, numbers from 10^{-9} to 10^{+9} can be represented with 16-bit accuracy, REI claimed.

Called Missy, the firmware costs $495 including programmable read-only memory. REI is at 15531 Cabrito Road, Van Nuys, Calif. 91406.



MINIPERIPHERALS

The survey participants reported plans to buy an unprecedented quantity and assortment of peripherals in 1976 for interconnection with their minis and micros.

Type of Peripheral	Qty to be Purchased By Survey Participants
CRT Terminals	45,558
Card Reader/Punch	2,067
Mag Tape Transports	10,276
Cassette/Cartridge Transports	4,257
Floppy Disk Drives	9,909
Disk/Cartridge Drives	13,285
Head-Per-Track Disk Drives	3,033
Line/Serial Printers	12,357
Teleprinters	18,466
Add-on Memory (core)	7,412
Add-on Memory (semiconductor)	2,650
Digital Plotters	809
Paper Tape Reader/Punch	3,659
A to D, D to A Converters	7,413

The survey report charts the percent share of the above prospective orders for all the major vendors including over 100 independent miniperipheral suppliers.

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William Taylor reads diagrams for Univac mark/read keypunch.

Completing setup ahead of schedule at Harris Corp. called for a game of cards between Larry Vest and Judy Thedford.

CW Photos by M. Upton

Chuck Rhinehart, IBM field engineer, works on IBM 3270 control unit.

Room for All Seen

Mini Firms Greet Mainframers in Small Business Area

By Toni Wiseman
Of the CW Staff

NEW YORK – Increased small business systems offerings by major mainframe manufacturers have not had a large impact on the sales of minicomputer manufacturers, according to a number of company representatives interviewed at NCC here last week.

In fact, the mini makers were unanimously pleased that IBM and other mainframers had decided to enter the market, thus making it "legitimate" in the eyes of users.

"There has always been formidable competition in the small business systems area, but we have our own customer base and the market is big enough for everyone to share," Harlan Dybdahl, head of marketing for Modular Computer Systems, Inc. (Modcomp), said.

"Everyone is offering something different – more or less power, faster throughput, etc. – so I don't see any problems, at least for us, over the next three to four years," he said. "IBM's entry has had the net effect of opening up the market, and there's always enough spillover for the rest of us."

Modcomp's business is about 60% OEM and large-volume end-user, with the Modcomp IV currently its most popular product, he said. He expects continued sales growth for the system in the telecommunications area as a result of multiterminal access and data base usage.

Modcomp has recently acquired ECS, a software company specializing in small business applications. As a subsidiary, renamed Modular Business Systems (MBS), it will do turnkey-type work for Modcomp systems, Dybdahl said.

Ben Holmes, Computer Systems Group marketing manager for Hewlett-Packard Co. (HP), agreed IBM's entry into the small business systems area will be good for HP, since this would undoubtedly expand the market.

HP should do well in the market, he said, since, "if you left HP to its own devices, with no IBM out there, we would have a tendency to be a full-service company, very end-user directed."

Holmes has not seen any change in order patterns, "though the trend toward more end-user business is there." There has been an upturn in OEM orders recently, however, which he attributed to that market's recent economic recovery. He did not expect it to be a long-range market trend, however.

"The minicomputer industry is more legitimate today in the eyes of most customers; it's not a funny little thing any more," Holmes said. "The industry is maturing and breaking into tiers."

"Competition is good. It give end users the benefit of the latest technological innovations in the industry," Ron Doiron, Microdata Corp's Reality product manager, said.

Welcomes Mainframers

Doiron welcomed mainframe manufacturers into the market, noting that, while IBM gives the market credibility, it can't afford to offer the end user the services Microdata and its dealerships can.

The small business systems market will grow to the point where, in 1980, after IBM takes it 35% to 50% share of the market, there will still be enough business to make 14 or 15 minicomputer manufacturers $100 million/year companies, he predicted.

Larry Meredith, General Automation, Inc. (GA) marketing manager for data management sytems, said: "Sure we're feeling it," referring to IBM's entry into the market, "but it's not impacting us from a revenue standpoint.

"The mainframe manufacturers are spreading the word. And we get a certain percentage of every ad they run and every sales call they make. So their entry can do nothing but help us," he said. Most GA systems are sold to OEMs, and the number of OEMs is increasing satisfactorily, he said.

GA's most popular product is the DM 130/2, at the low end of the DM 100 series, he said. Its popularity is largely because of its price. It is also the only system sold as a package, with a fixed set of peripherals including a 10M-byte disk drive, two CRTs and a 165 char./sec printer, he said.

Meredith predicted GA's orders will increase for low-end systems, as the firm

(Continued on Page 48)

CRT, Disk Drive Vendors Praise Order Upswing

By Molly Upton
Of the CW Staff

NEW YORK – "Fantastic," "super" and "excellent" were some of the descriptions given by vendors of CRTs and disk drives when asked how business is compared with six months ago.

Business is "super" and growing at 40% a year at Beehive Terminals, according to Duke De Forest, vice-president of sales engineering.

John A. Hill, vice-president of sales for Megadata Corp., observed business is on a "definite upturn," while Richard Kaufman, director of marketing for Applied Digital Data Systems, Inc., said he has seen a tremendous upsurge in activity across the board.

The CRT business has "picked up in tempo," and "is getting better all the time," according to Lear Siegler, Inc.'s Bill Terry, national sales manager.

TEC, Inc.'s Bruce Hamilton said the firm's business is up about 30% over a year ago and 20% over six months ago.

Delta Data Systems, Inc. has been experiencing a lot of new business, partly because of new products in the intelligent terminal area, according to Gary Bard, Delta Data Systems, Inc.

Business is "excellent," up 20% over six months ago, Andy Mathews, national sales manager at Hazeltine Corp., said.

Calcomp Graphics Growing

California Computer Products, Inc.'s (Calcomp) – OEM disk drive business is definitely up and the graphics area continues to grow at a reasonable rate, considering graphics tend to suffer in a bad economy, according to Paul F. Seckendorf, president of product marketing.

Ray Crowder, Control Data Corp.'s product sales manager for disks, said business is "fantastic," definitely better than six months ago.

At Diva Corp., business has grown threefold in the past six months, according to Gary Beebower. He attributed the rise to both changes in the marketing structure and new disk products.

Business 'Booming'

Memorex Corp.'s Bob Booth, sales promotion manager, said business is "booming," stronger by about 50% than six months ago.

David Ophir, president of Ontel Corp., maker of intelligent CRTs, said business is very good since the firm started its marketing effort, and it has picked up overseas.

However, since the firm is essentially still phasing in production, comparisons with the past are virtually meaningless, he said.

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Sometimes technicians become furniture movers.

CW Photos by M. Upton

John Sokol of an audiovisual firm takes a break while setting up the Univac booth.

Mini Firms Expect Upward Trend To Continue for Next Six Months

By Toni Wiseman
Of the CW Staff

NEW YORK – Business has been on an upward swing for mini manufacturers for the last six months, and they expect to continue in the same pattern for at least the next six, according to several companies interviewed at NCC here last week.

Orders have been up substantially in the last six months, according to Ben Holmes, Hewlett-Packard Co.'s Computer Systems Group marketing manager, and the company expects business to get even better.

"We've got three good new products, and I think in the minicomputer industry a firm's orders are a function of new products," he said.

Harlan Dybdahl, head of marketing at Modular Computer Systems, Inc. (Modcomp), agreed with Holmes' optimistic outlook, noting sales in the last year had reached $38 million. He projected growth to $52 million for this year, based on the upward trend of the last six months.

The order rate for all product lines is picking up at General Automation, Inc., according to Larry Meredith, data management systems marketing manager. Sales have been particularly strong in the last two or three months, he said, "and the curve is getting even sharper."

At Prime Computer, Inc., first-quarter sales were up 78% as compared with the year-ago period, according to Gabe d'Annunzio.

Prime expects the trend to continue at the same rate for some time, he said.

Prime is concentrating on large end users who are interested in decentralizing, rather than on small first-time users.

Data General Corp. (DG) is currently shipping more systems to OEMs than to end users, Don McDougall, international marketing manager, said. The ratio is about 60% to OEMs and 40% to end users.

"The whole industry is shipping more to OEMs now because they let their inventories run down during the recession and they are now replenishing," he said.

CRT Makers Cite Price Cutting In Semi-Intelligent Terminals

By Molly Upton
Of the CW Staff

NEW YORK – The price war so prevalent in the glass Teletype replacement field of CRTs two years ago has migrated to where the current action is – in the semi-intelligent CRT field, according to several makers exhibiting here at NCC.

"There is a definite price war among the semi-intelligent CRTs," according to Bill Terry, national sales manager of Lear Siegler, Inc. (LSI).

This pricing situation should bottom out by the end of the year or spring, he said.

While not all those interviewed acknowledged the existence of price cutting per se, there was unanimous agreement the microprocessor has had the most significan impact on the CRT marketplace.

An increasing number of firms are adding semi-intelligent models in their line, partially because such products offer higher margins than the glass Teletypes and partially because of market demand.

Although all agreed there are various ways of defining intelligence, for the purposes of these interviews a semi-intelligent terminal was defined as having editing capabilities, but not begin user-programmable.

Shakeout Occurring

Duke De Forest, vice-president of marketing for Beehive Terminals, and John A. Hill, vice-president of sales for Megadata Corp., saw a shakeout occurring as makers only of dumb CRTs tend toward broader product lines.

De Forest estimated a CRT maker whose sole line was dumb CRTs would have a lifetime of one year if it didn't offer more breadth in its line.

Richard Kaufman, director of marketing for Applied Digital Data Systems, Inc. (Adds) said the shakeout has already happened in a way. Companies are still around, but are not maintaining their market share, he said.

For example, the market is growing at 40% to 50%, and Adds has grown from $2 million a few years ago to $18 million while others have grown from $2 million to $8 million, he said.

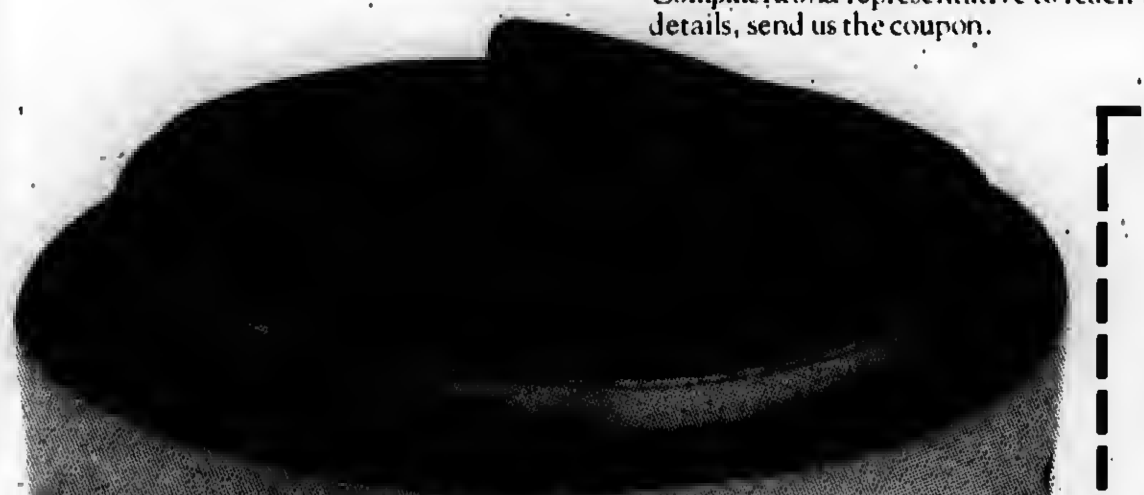
Bill Terry

Kaufman was less emphatic about price cutting, saying the industry has matured so he doesn't see any drastic 30% to 40% cuts as there were in the past. However, it's a "highly competitive field," he said.

TEC, Inc.'s Bruce Hamilton said he hasn't seen a lot of price cutting, but he has seen different ways of pricing.

Andy Mathews, national sales manager of Hazeltine Corp., said pricing cutting has just about bottomed out. As technol-

(Continued on Page 48)



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This was the finding of a recent study by the U.S. Department of Commerce, published in *Export Market Digest*. And the U.S. Dept. of Commerce is an excellent source of information on marketing prospects in Japan. In summary, they report that:

1. Japan will continue to increase imports of foreign-manufactured EDP equipment at the rate of 30% per year through 1977. In 1977, total Japanese DP imports will exceed $1 billion per year.
2. The U.S. share of the Japanese import market is 55%. This should remain constant, although in previous years the U.S. share has reached as high as 70%.
3. Minicomputer sales in Japan are expected to chart a phenomenal 60% annual growth rate through 1977.
4. Independent peripheral equipment purchases are expected to rise 44% in this period.

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Mini Makers Greet Mainframers; Expansion Cited

(Continued from Page 46)

makes the system more flexible by adding more capability.

Small business systems as a part of networks are becoming a large portion of its business, he said, so GA is expanding the communications capabilities of the DM 100 series, allowing the systems to emulate remote job entry functions, for example.

While the company is in a period of stability with the DM 100, with no major new thrusts anticipated, over the next six to 12 months there will be an effort to incorporate the new Solution series hardware into the DM 100 series, for cost and performance reasons, Meredith said. Solution series hardware is microcomputer-based.

"The Solution hardware is hotter stuff than the DM 100," he said, "and we don't want to be in the forefront of this market.

"Our first-time users don't care what the hardware is as long as it works, but there will be big benefits in terms of price, as well as better performance and more capability, with the micro hardware, and we can pass this on to the user."

"There will always be two types of companies in the small business systems area," according to David S. Greenberg of Mini-Computer Systems (MCS). "First there are the IBMs, which have the money for marketing, and the companies which try to emulate the IBMs. The other type of company is the one which will stay at the personal level, like MCS."

Always a Need

"There will always be a need for us," he said, "just as there is a need for the Mom and Pop corner store even though there may be an A&P or Kroger's right next door.

"Prices may be a little higher, but the Mom and Pop operation does that little bit extra to get the business. That's where we come in," he said.

Greenberg predicted most business will grow as the company gets into application software in the next six months, mainly through systems houses.

Don McDougall, international marketing manager for Data General Corp. (DG) said DG is aiming for the market between the IBM 370 users and the IBM 3, System 32 and similar systems users. This user is either a 370 user who wants to decentralize or a small business system user who wants to upgrade, he said.

This middle-area user typically is a sophisticated user who wants data base, compatibility and real-time capability, McDougall said.

McDougall predicted that micros, such as DG's recently introduced Micro Nova, will become very important in the small business systems area, as there is not much call for large peripherals in these configurations.

Prime Computer, Inc.'s business hinges on the Create Series, Gabe d'Annunzio said. But by early fall the company expects to announce the Transact Series, a business system based on the Create philosophy.

The Create Series is a group of packaged hardware/software configurations, each designed to provide a different level of performance for interactive computation and time-sharing, he said.

The Transact Series, d'Annunzio predicted, will be a packaged starter system consisting of the hardware configuration and operating system. "Basically, everything one needs to plug in one's own application software," he said, noting that its target market is the large user who wants to decentralize.

Interdata, Inc. is just getting into what might be considered the small business systems area, depending on how that market is defined, according to President Dan Sinnott.

The company currently has a product management team working strictly on commercial business systems, he said, "but we've been atypical in this area in that we've waited to get into it until we knew our software and hardware was proven."

The support requirement with the business systems users is going to be much higher than minicomputer manufacturers are used to. "The users expect much more hand holding than we're used to; they aren't box-oriented," Sinnot said.

Four-Phase Systems, Inc. introduced a distributed processing system, the System IV/50 at NCC, confirming its view that the small business systems market is a viable one.

Semi-Intelligent Units Undergoing Price War

(Continued from Page 47)

ogy advances, the mill costs go down, but the overhead costs rise, he said. "It's got to reach a point of equilibrium," he added.

"As the technological state of the art catches up with our part of the industry, the cost of semi-intelligent terminals should go down within four months," Terry of LSI said.

By 1977, firms will have to offer a microprocessor version of CRTs or they won't be able to stay in business, he said.

Demand for semi-intelligent terminals is increasing, several agreed.

CW Photo by M. Upton

John A. Hill

The growth is coming in the upper end of LSI's line, Terry said, which accounts for half the firm's shipments and two-thirds of revenues.

Beehive is expanding its product line in both the low and high end, De Forest observed, with the new models B 100, 500 and 800.

TEC's hottest product is a unit that sells for $1,500 in OEM quantities and is above a dumb terminal, but has no editing capability, Hamilton said. The unit has a movable cursor and is a buffered machine, he said.

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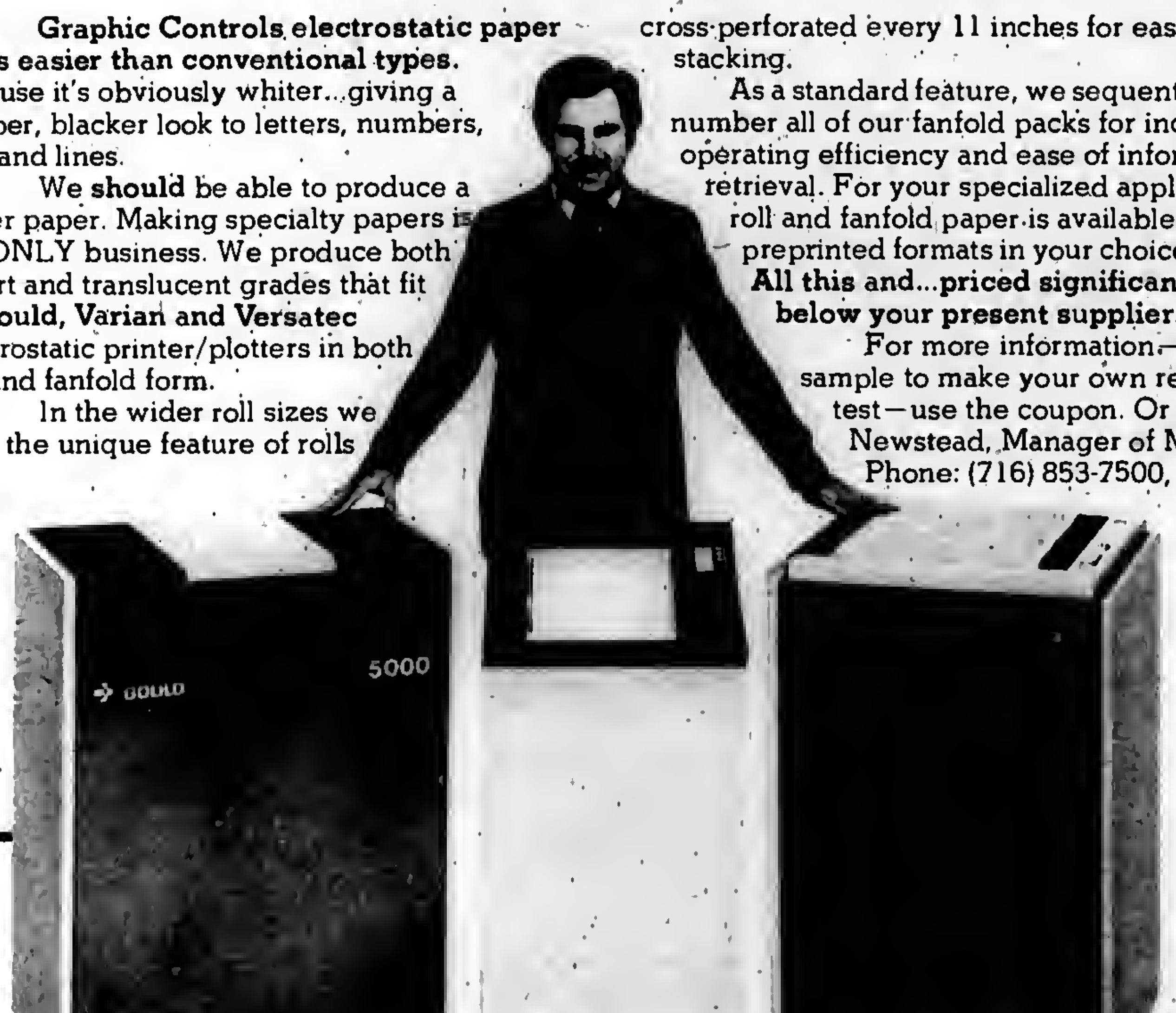

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Third-Party Lessors Invading IBM's Japanese Market

TOKYO – The invasion of major third-party computer leasing companies into IBM's user market here may be a bitter pill for the giant to swallow, according to *EDP/Japan Report* (EDP/JR).

The appearance of third-party leasing firms means IBM Japan will have to maintain all its systems which are leased by those firms; in addition, the prices of IBM systems will have to be cut to cope with price competition from the third-party lessors, EDP/JR said.

In a preliminary move to combat advances by the lessors, IBM Japan has started offering a three-year Term Lease Plan (TLP) to its 370 series users, the newsletter noted.

The adoption of a three-year TLP rather than the four-year TLP in Japan will also help combat the intensifying competition IBM Japan is facing from Fujitsu and Hitachi with their M series computers, according to EDP/JR.

Making Presence Known

In the past, third-party lessors have been discouraged by the number of restrictions imposed by the Japanese government. Itel, however, has been operating in Japan through its local partner, Showa Information Systems, since 1973.

This year, several others will join Itel.

Greyhound Computer recently started marketing IBM 360s and low-end 370s through a Japanese computer leasing firm, Computer Consultants, Inc.

The main target market for the Greyhound systems will be medium-to-small-sized firms which have enough business volume to justify IBM 360 systems, as well as large companies which will use 370s as backup systems, EDP/JR said.

At the other end of the scale, Continental Information Systems, Inc., is planning to distribute 370/145s, 370/158s and probably used 360 systems.

The firm, EDP/JR reported, is said to have reached a basic agreement with Nippon Computer Co. and is engaging in the leasing of IBM disk packs, data modules, modems and converters.

Finally, National Computer Rental, a subsidiary of Flying Tiger Corp., is presently negotiating terms with a Japanese leasing firm.

Two Factors Important

In order to venture into the third-party leasing business, at least three resources are necessary:

- Financial resources to support operating lease services.
- Marketing forces to sell leasing services.
- Field engineering service to maintain installed systems.

Since IBM will be obligated to maintain all of its installed systems, leased or otherwise, third-party lessors will be concentrating on the other two prerequisites, primarily on locating good financial support to initiate operation of a leasing service, according to EDP/JR.

This is a problem in Japan since the depreciation plan of seven to eight years which is still common in some Western countries is difficult to apply to the market here for three reasons.

First, the average length of use for a computer system in Japan is a relatively short period of 40 months.

Second, most Japanese users tend to want "new" equipment, making it difficult of re-lease or resell returned computers.

And, finally, insurance systems do not exist which insure the risks accompanying the cancellation of a leasing term by a user.

This means the third-party lessors must apply the shorter legal depreciation term of six years, making it necessary for them to find backers who will provide funds with the lowest possible interest rates.

This, in turn, will keep the leasing price at the lowest level – necessary in order to compete with the computer manufacturers' rental prices, EDP/JR said.

"Industrial sources estimate that users of third-party leased computers should be able to win cost advantages of 40% to 50% for 360 series computers and 15% to 25% for 370 systems with a minimum commitment of four years," according to EDP/JR.

Expansions

Incoterm Corp. is planning to move its corporate headquarters to Wellesley, Mass., by July 1. It is also relocating its southeastern regional office and branch office to expanded facilities in McLean, Va.

Xerox Computer Services has moved to larger quarters in Rochelle Park, N.J.

Computer Transmission Corp. has expanded its manufacturing facilities in El Segundo, Calif.

Management Assistance, Inc. (MAI) will expand its existing facility at Houston, Texas to operate as Genesis One Products Corp., an MAI company. Production facilities will be expanded by 30%.

Burroughs Corp. has leased 9,600 sq ft of office and warehouse space in Irvine, Calif.

MDB Systems, Inc. has expanded three times in size with the purchase of new facilities in Orange, Calif.

Xbec Systems, Inc. has moved to 2985 Kifer Road, Santa Clara, Calif. 95051.

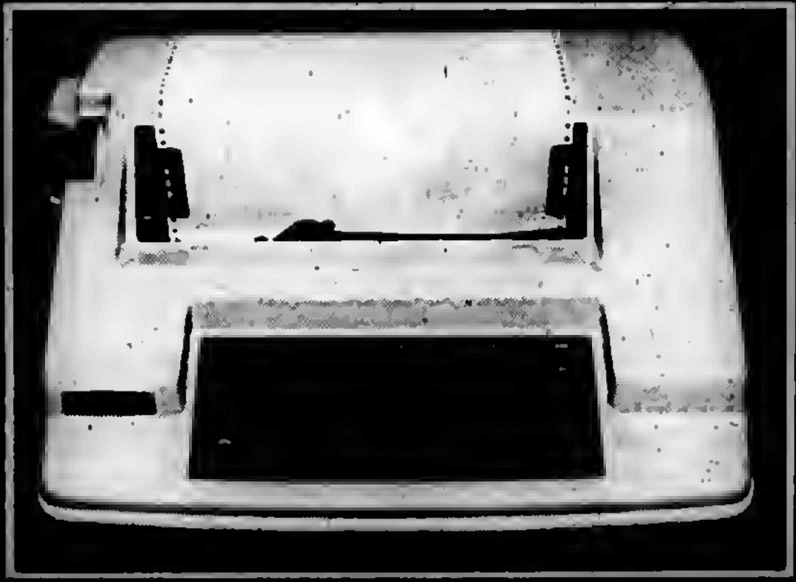
The Kennedy Co. has established a European service center and parts depot in Zeist, Netherlands under the auspices of Datacare.

Logic Share, Inc. has leased a 3,000 sq-ft building for offices at 4023 Birch Ave., Newport Beach, Calif.

Management Science America, Inc. has moved its recently acquired Management Information Service and the Alltax tax calculation package operation from Ramsey, N.J., to Atlanta, Ga.

Executive Corner

- E.H. Van Hoesen has been appointed president of IBM's Information Records Division.
- Norman A. Fletcher has been named president of Computer Peripherals, Inc., a firm jointly owned by NCR, Control Data Corp. and ICL Ltd.
- Rowland H. Thomas Jr. has been named vice-president of product marketing at Data General Corp.
- James Gafke was promoted to executive vice-president of the Computer Products Division of Itel Corp's Data Products Group.
- William N. Stirlen has been named vice-president of corporate development for Computer Consoles, Inc.
- Michael H. Smith has joined CRA, Inc., a Phoenix-based sales and service firm, as vice-president of equipment leasing and financing.
- David V. Ragone has been named to the board of directors of Sycor, Inc.
- William A. Boss has been named vice-president/director of marketing support for Pansophic Systems, Inc.
- David I. Caplan has joined Inforex as vice-president of engineering.
- Russell Gems has joined Cipher Data Products, Inc. as vice-president of operations.
- Digital Equipment Corp. has appointed four new vice-presidents: William C. Hanson, volume manufacturing; Henry P. Lemaire, component manufacturing and engineering; Edward A. Schwartz, secretary, general counsel; and John F. Smith, systems manufacturing.
- Philip Present has been named vice-president of marketing for business systems products at Olivetti Corp. of America, where E.W. Grossman was named vice-president of customer engineering service.
- John W. Brackett has been named president, director and chief executive officer of Softech, Inc.
- Vincent S. Balhorn has joined Data 100 Corp. as vice-president of field engineering. Steven J. Shamblott was promoted to vice-president of sales.
- Edward P. Gistaro was elected to the board of directors and John R. Walker was elected senior vice-president of operations of Datapoint Corp. In addition, John M. Cochran, Richard V. Palermo and Daniel Hosage were named Datapoint vice-presidents of customer service and marketing administration, corporate development and special marketing programs respectively.
- Rene L. Eris has been appointed president and Stephen V. Tritto vice-president of marketing at Carter Associates.
- Paul K. McCarrick has been named vice-president of Autex, Inc. and will head the Field Operations Department.
- Paul J. Rizzo, a senior vice-president, group head and director of IBM Corp., has been nominated a director of Continental Illinois Corp.
- Robert N. Brown has been elected vice-president of engineering and Milton Sanders has been named vice-president of marketing at Electronic Associates, Inc.



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Big Market Seen in Algeria

WASHINGTON, D.C. – Talks between Algerian and U.S. government and industry officials here have disclosed a multi-million-dollar market for American manufacturers of DP equipment in Algeria, according to the U.S. Department of Commerce.

Algeria's National EDP Authority is preparing a five-year computer development plan to be published later this year which will focus on the development of management information systems for industrial, commercial and agricultural uses.

The Algerian Authority is seeking technical assistance from U.S. firms for systems design, training and, eventually, development of local DP manufacturing for domestic consumption, according to Commerce.

U.S. firms interested in Algeria's DP development program may write – preferably in French – to the Commissariat National a l'Informatique, 4 Blvd. Mohamed V, Algiers, Algeria.

U.S. Firms Seeking Japanese Reps

TOKYO – Five American companies are seeking Japanese agents to import and sell their products and help in local leasing of computer equipment, according to an article in *The Japan Economic Journal*.

The companies are Delta Data Systems Corp. of Cornwells Heights, Pa.; Continental Information Systems Corp. of Syracuse, N.Y.; Advanced Systems, Inc. of Elk Grove Village, Ill.; Courier Terminal Systems, Inc. of Phoenix; and National Computer Rental Ltd. of New York, N.Y..

The companies' decisions follow Japan's liberalization of its DP industry and DP import industry last December, according to the newspaper.

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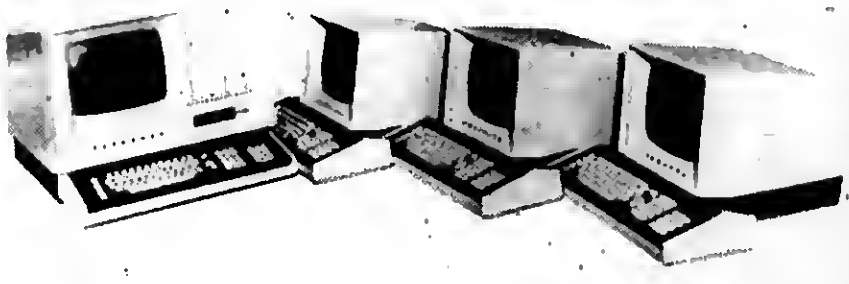

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Philips Bridges System Gap With P410

EINDHOVEN, The Netherlands – Philips Data Systems has unveiled the P410 system which handles transaction and batch processing simultaneously, it said.

The system represents the midpoint between the firm's 300 line and its larger systems.

Main memory ranges from 16K to 64K of core with a cycle time of 1.5 μsec. The 6K control memory contains 40 bits of read-only memory.

The accompanying disk drive includes one fixed and one removable cartridge disk.

The main cabinet is divided into two parts, one with the keyboard and 32-character display that prompts the operator and paper handling. The other has internal peripherals and adapters for external peripherals, the firm said.

The system also includes a 100 char./sec dot matrix printer.

International News

Magnetic ledger card processing is available as an option, allowing 320 users a smooth upgrade, according to Philips.

Currently the system can process two programs simultaneously and this capability may be extended to four programs, the firm said. One cassette station is standard on the P410 and up to four are offered.

The I/O system can handle up to 16 local and remote peripherals. Four dual disk drives, two line printers of 70- to 200 line/min, a card reader and card punch can be connected locally, the firm said.

Initially the system will be available with one inquiry station; the firm plans to offer up to four stations in the future.

The P410 can be linked to other CPUs in a distributed network, Philips said.

A library of modular programs is available for use on the 410 and individual programming can be done in Cobol, scientific Basic and Ideal, the firm said.

Politics Blamed

British Rail Shelves Reservations Plan

By Ivan Berenyi
Special to Computerworld

LONDON – British Rail (BR), which is now facing record losses, has decided to postpone indefinitely its long-running computerized seat and sleeper reservations project.

An attempt is being made to blame this decision on loss-cutting economies, but in fact it stems from political interference.

The projeot's high point was 1974, when bids were invited and received from IBM, Univac and Britain's International Computers Ltd. (ICL). The British bid was based on its 2900 system, at that point not even officially in existence; and an operating system called System B, which observors said was unsuitable for a transaction-oriented environment.

ICL's bid was also the most expensive of the three, so BR's DP team rejected it in favor of a dual-processor Univac 1110 configuration.

That was its undoing, for BR had only the previous year demanded and obtained a free reign to specify hardware for its version of Tops, the freight wagon control system designed by IBM and Southern Pacific.

That order predictably went to IBM, and the UK Department of Industry had to sit back and watch a nationalized enterprise channelling $32.5 million in hardware and software costs almost entirely to the U.S. as the first half of the Tops budget.

Faced with the prospect of another $32.5 million going abroad on the reservations system, the Department of Industry, which funds ICL, dug in its heels and put pressure on the Department of the Environment (DOE), BR's sponsor, to make the rail network buy British.

Meanwhile, steeply rising ticket prices on the railway had created customer resistance, slowly eroding the basis of BR's calculation that reservations would rise tenfold in six years. The DOE used this as an excuse to force BR into a "full reexamination" of the whole scheme.

BR then asked Univac to produce a scaled-down version of the reservations system, this time based on either a single 1110 or even an 1106 – what the railway termed an "interim solution."

But the delay gave ICL time to come up with a new bid based on a 1.5M-byte 2970, officially annouced by then and equipped with the newly developed System D (and later an improved version called System T) operating system.

BR was still not impressed, however, and put its revised Univac proposals to the DOE in mid-1975, already accepting that the 1977 start-up date (itself revised from the original 1974 target) would have to be scrapped.

The government proved equally adamant, however, that the order should not go to Univac, which (unlike IBM, Honeywell, NCR, etc.) does not even have a UK manufacturing plant. A stalemate ensued.

Now BR management has agreed to postpone the whole project for an indefinite period. It will, it said unofficially, be reviewed annually.

This leaves BR in the position of being the only major rail operator in the world (except for Indian Railways) which has neither a computerized reservations system or firm plans for one.

CMC Expects Orders For Korean Systems

SEOUL, Korea – At least another 10 CMC 5 systems will be ordered in this country this year, according to W.B. Lee, president of Jyoni Business International, distributor of Computer Machinery Corp. (CMC) products in Korea.

CMC International's recent three-day show here was attended by about 100 persons, evidence of increasing interest in key-to-disk and key-to-tape data entry, he said.

Flying Disks

A number of U.S. companies are finding it more convenient and economical to air freight magnetic disks and tapes rather than the more bulky punched card decks, CMC said.

Historically, U.S. companies have sent source information to Korea for keypunching into cards.

Orders for two CMC 5 systems with 10 keystations each have been received from Korea.

Foreign Orders & Installations

Burroughs Wins Order For $20 Million in UK

LONDON – Midland Bank Ltd. has ordered two large-scale B7700 systems from Burroughs Machines Ltd. for a combined value of about $20 million.

Each B7700 will be equipped with four central processors and replace B6700 dual-processor systems currently serving 2,300 Burroughs terminals in branches throughout England and Wales.

The first B7700 will be delivered this year, the second in 1977.

Other Awards

Schiphol Airport in Holland has installed two Model 3403 controllers and two Model 3016 rotating memories from Vermont Research Corp. as part of a departure control system.

Southampton College of Technology in England has ordered a Teacher One Model 4 computer system from Computer Technology Ltd. to teach students programming and DP.

The University of Manchester in England has ordered T800 tape transports and D3000 twin disk operating units from Pertec Corp.

Tokyo Tanabe Seiyaku Co. Ltd. has ordered a Univac 90/60 for production and meterial control.

The Postal and Telecommunications Ministry of France has ordered its third letter-mail reading and sorting system from Recognition Equipmt, Inc.

Barclays Bank International Ltd., has ordered two NCR 643 computer output microfilm units.

Several Elements Key to TRW's Place in POS Market

Special to Computerworld

HAWTHORNE, Calif. – TRW's recent introduction of a point-of-sale (POS) terminal is but one element contributing to the firm's position in the POS marketplace, according to Richard A. Campbell, vice-president and general manager of TRW Communications Systems and Services.

Recent news about TRW's POS business has concentrated on the release of the terminal system [CW, May 31] and an agreement with the Singer Co. under which TRW will perform the maintenance and customer support functions for Singer's Business Machines Division's North American Marketing and Services operations.

"We've been supplying advanced interactive POS systems for two years," Campbell said. "The POS cash register is just an element.

"Another key element is the communications system that links the POS terminal and the many other data entry points into a cohesive, cost-effective system. TRW's experience in this area is one big reason major retailers are talking to us," he added.

Another reason, Campbell said, is TRW's market position.

"We are known primarily as a communications system supplier. As such, TRW is unique because we can hook up whatever terminals the retailer wants and work with whatever central computer he uses," Campbell said.

"In doing this, we emphasize reducing costs and improving the reliability of the retailer's data communications system," he added.

TRW has an edge in communications, he said, noting that, "between our retail POS, credit authorization, check-cashing and banking systems, TRW has over 60,000 interactive communications terminals in operation."

Financial Ability

On the question of TRW's financial ability to continue fulfilling its commitments to retailers, Campbell acknowledged TRW is making a substantial investment in the business and start-up costs have deferred profits in the POS area.

"The company is operating under a carefully laid out long-range plan that identifies the importance of the program and highlights objectives and milestones for TRW management," he said.

"This stress on planning and control has been a major factor in TRW's successful management of new business programs with a high advanced technology content over the past 20 years. A key part of this is knowing in advance the investment that will be required," he stated.

In Campbell's view, TRW's customer base and product strategy are both important in measuring the company's posture and potential.

"We've taken a building-block approach in introducing retailers to real-time communications systems," he said.

"We've introduced credit authorization systems in 50 major department store companies over the past five years. This has been a high payout application.

"Once a store establishes a communications system for TRW credit authorization terminals, the same communications lines can be used to support POS terminals," he observed.

As a result, TRW anticipates much of its future market will come from stores already served by TRW in some way. And, in many cases, TRW terminals and minicomputer-based communications systems will be used along with terminals from other manufacturers – all sharing the same data communications lines.

One other major goal for TRW is to help retailers and financial institutions work together toward making the electronic transfer of funds practical. TRW has already helped start point-of-sale electronic funds transfer system for Glendale Federal Savings and Loan in California, Campbell said.

"TRW is working toward communications systems that involve financial institutions, retailers and supermarkets," he said. "Our internal organization of communications systems resources reflects this goal."

TRW is now developing retail and financial communications systems from a common technological base and will benefit from economies of sale in the development, manufacturing and customer service areas, he added.

Contracts

National CSS, Inc. has received a two-year, $4.2 million service contract from Pacific Telephone and Telegraph Co. to provide a dedicated interactive system consisting of an IBM 370/158 and including support personnel.

Kennedy Co. has received a $500,000 add-on contract from Spectron Corp. for Model 331 digital cartridge recorders to be used in Spectron's Datascope test instrument.

Raytheon Service Co. has received a five-year contract from Cambridge Memories, Inc. (CMI) to be the sole provider of field maintenance services for CMI end-user products in the U.S. and Canada. The contract gives Raytheon more than 500 new customers with an installed base of equipment valued at about $30 million.

Pertec Corp.'s Peripheral Equipment Division has been awarded a supplies contract from Micro Instrumentation and Telemetry Systems, Inc. for both rigid and flexible disk drives under an OEM agreement estimated at about $690,000.

Wiltek, Inc. has signed a contract with Amstar Corp. for a nationwide communications network of Wiltek II terminals controlled by the Wilcom Communications Computer Service.

Zentec Corp. has received a contract from Technicon Medical Information Systems Corp. for Zentec's 9000 series terminals to be used in the Technicon Medical Information System.

Shugart Associates has received a multiyear $1.6 million contract from Data 100 Corp. for delivery of SA800 floppy disk drives to be used in Data 100's Model 77 key/diskette systems.

Systematics, Inc. has received a facilities management contract from Independent Bankshares Corp. for establishment of a four-bank DP center to provide services.

Burroughs Corp.'s Federal Special Systems Group has received a contract from the U.S. Air Force for a B6750 system and 78 on-line remote terminals which will be used in Armed Forces Examining and Entrance Stations and U.S. Recruiting Group and service installations. The contract is estimated at $4.3 million.

How to make sure your contracts work for you instead of against you.

In just two and a half days, *"Legal Tools for Computer Contracting and Protection"* will give you what you need to know to protect your equipment, your systems and your organization.

When the lawyers for one of your suppliers sit down to draft a contract for you to sign, you can bet they don't have your best interests in mind. But you don't have to be defenseless. Given a basic knowledge of the unique problems of contracting in the computer industry, you can make sure your contracts are working to get you what you're paying for — not protecting the other guy from his mistakes. And that's just what this seminar can do for you. We will even review your current contracts — right in class.

The Course Work

Roy Freed, the seminar leader, will review all types of contracts impacting computer use, including:

- the lease or purchase of systems — bundled or unbundled
- the purchase of time-sharing, data processing services and consultation
- the use of facilities management
- and others

In addition to a basic review of the laws regulating DP contracting and taxation, you'll learn how to apply the legal rules in a positive way to gain advantage for yourself. And *bring your own contracts, because they will be an important part of the course work.* All registrants are invited to bring their contract forms to the seminar for discussion and review to the extent feasible

In the workshops you'll gain practical experience with the techniques under study. You'll learn, for example, how to recognize opportunities to negotiate; how to establish performance goals and conditions while you can still do something about it; how to avoid costly litigation and resolve disputes; and how to achieve significant tax savings through the proper structuring and wording of contracts. Plus, you'll gain valuable experience with techniques for handling any transaction. Overall, you'll have an excellent chance to learn a great deal in a short time, as many of our earlier participants have found:

"This seminar will provide me with an ability to evaluate future contracts and renewal contracts for refinement purposes. This course has been excellent."
F. Ford, Entrex, Burlington, Mass.

"I considered this to be a very good fundamental review of basic problems associated with EDP contracting."
J. M. Aubry, Canadian Government

"This was an exceptionally well organized seminar. The material presented was significant and useful. This seminar would be of great practical value to someone without computer contracting experience as well as serving as a useful outlet and review for those with more background and experience."
William C. Prinn, Director, Advanced Planning
Chessie System, Baltimore, Md.

"I had no idea that we would have the opportunity to communicate so closely on an informal basis. That, combined with your excellent preparation, made this experience the most rewarding seminar experience I've had. I commend you for what I regard as a most worthwhile seminar, and thank you for your genuine interest in communicating with, and not merely to the participants."
SV, Attorney, Worcester, Mass.

"The appropriateness of this seminar is extremely important. This area of the Computer Science field has generally received little or no attention from user, vendor or the legal professions."
D.J. Connelly, Development & Control Manager
Norton Company, Worcester, Mass.

Roy N. Freed Is the Seminar Leader.

Roy N. Freed is internationally known for his acuity and expertise in this field, and he will personally direct the entire seminar. A graduate of Yale Law School, Roy has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private corporate practice in greater Boston with the firm of Pollock, O'Connor and Jacobs. He teaches at Boston University Law School, and has written many articles on this subject, including "Computer Fraud, a Management Trap" (Business Horizons), and "Get The Computer System You Want" (Harvard Business Review). He is the author of the book, *Computers and Law — a Reference Work*, now in its fourth edition, and he also edited the complete, extensive course materials used in this seminar.

Charges and Enrollment

The charge for the entire 2½ day seminar, including continental breakfasts, luncheons, and all course materials is $325 per registrant. Additional registrants from the same company are charged only $275. This does not include hotel rooms, if necessary, but we have reserved space at the seminar hotels for attendees who wish them.

To enroll, look over the schedule below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Military Mini Maker Aims For Bigger Market Share

By Esther Surden

Of the CW Staff

CUPERTINO, Calif. – Rolm Corp., maker of ruggedized minicomputers primarily marketed to the military, intends to get into the industrial marketplace in a bigger way, according to Pat Groves, computer product line manager.

The firm was established in 1969 to provide ruggedized minis and acquired a software license from Data General Corp. (DG). The entire Rolm line is compatible with DG Nova software, Groves said in an interview here recently.

Rolm recently added a minicomputer-controlled PBX system to its product line; most of the firm's expansion is taking place within this product line, he said.

In the future Rolm will also aim at the business-oriented marketplace. A third product line, less expensive than the minicomputer line it produces for the government and based on microcomputer technology, will be developed.

The firm will then deal directly with businesses and small customers. For the moment, much of its minicomputer business is OEM except for the industrial users.

Unsatisfactory Customer

"I think that no one who sells primarily to the government is very satisfied with that situation because all money that comes from the government can be politically controlled," Groves said.

In addition, the Renegotiation Act, which says the government can look at all books of companies selling exclusively to the government, can be disquieting, he said.

For the fiscal year ending in June, sales for the company will be about $12 million, Groves said, and within a few years the PBX and computer sales should be about equal.

"Our approach in the business has been to sell to research and development projects and not to large procurement contracts," Groves said. Thus the mini business is mainly in single or small quantity sales.

However, within the next two years, the firm expects some of the R&D projects to develop into large contracts:

Groves estimated about 2,000 Rolm ruggedized minis are out in the field at the moment, with the firm's 1601 representing more sales than any other item.

The firm provides a catalog of systems and peripherals, and users buy right out of the catalog.

No Eclipse Compatibility Yet

Rolm hasn't developed an Eclipse-compatible system yet, Groves said, because Data General is protective of its Infos and Fortran V software for the Eclipse and has never released the source code.

"We cannot use its software without the capability of modifying it," Groves said.

Reliability is the keyword in the rugged mini game, Groves said. The firm's mean time between failure is 8,000 hours, he said.

"A lot of companies think the way to get reliability is to use very expensive, high-reliability parts. Rolm uses good commercial parts" and takes care in assembly, he said.

After the assembled parts are put through 50 to 100 hours of testing that includes a shake table and "ovens," the systems are then put together with their peripherals and then undergo more testing before the configuration is shipped, Groves said.

Orders & Installations

Randall's Food Market of Houston has installed Sweda's Series 600/80 electronic point-of-sale system.

First Federal Savings & Loan Association of Dallas has ordered a Univac 90/60 to provide on-line processing capability for 30 branch offices.

Southern States Cooperative, an agricultural association, has ordered 250 NCR 250 electronic cash registers and magnetic tape cassette recorders, 100 NCR 210 electronic cash registers and an NCR 725 minicomputer.

The American Animal Hospital Association of South Bend, Ind., has installed a Burroughs B700 system to maintain membership information.

The *Great Falls* (Mont.) *Tribune* **has ordered a Harris 2550 copy-processing system, including 17 editorial terminals, from Harris Corp.**

The American National Bank of Bakersfield, Calif., has ordered three Diebold, Inc. Total Banking Systems as part of its 24-hour banking service.

The Bethlehem, Pa. *Globe-Times* has ordered a dual Typeset-11 computer system from Digital Equipment Corp.

The General Services Administration is installing NCR point-of-sale equipment in its 80 self-service supply stores. The equipment includes 85 NCR 250 electronic cash registers and 12 NCR 747 tag and label printers.

POSITION ANNOUNCEMENTS

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position announcements

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Minimum qualifications: B.S. in Computer Science, Mathematics, or Physics. Experience in computer programming essential; emphasis on numerical applications and acquaintance with physics, chemistry, and cloud physics desirable. Salary: around $10,000. Dates: 1 Sept. 1976-31 Aug. 1977 (negotiable). Reply by 16 Aug. 1976 to J.L. Kassner, Jr., Cloud Physics Research Center, Univ. of MO-Rolla, Rolla, MD, 65401. *THE UNIV. OF MO IS AN EQUAL OPPORTUNITY EMPLOYER.*

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EXECUTIVE DIRECTOR

Mid-Illinois Computer Cooperative

The Mid-Illinois Computer Cooperative (MICC) a computer network providing timesharing and remote batch academic computing services to five state universities, seeks applications for the position of Executive Director. MICC operates a Control Data Cyber 72 computer system under KRONOS operating system on the campus of Southern Illinois University at Edwardsville. Other members of MICC include Eastern Illinois University, Illinois State University, Sangamon State University and Western Illinois University.

The Executive Director is the chief operating officer of MICC and reports to the MICC Operating Board. Minimum qualifications for the position include a Ph.D. degree and five years of progressively responsible experience in the management of an academic computing facility or an equivalent combination of education and experience. Salary range is $24,000 to $28,000 annually. Deadline for receipt of applications is June 21, 1976. Applications should be sent to:

Dr. Warren Harden
Chairman, MICC Operating Board
Office of Institutional Research
and Computer Operations
Illinois State University
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position announcements

position announcements

SUPERVISING ANALYST/ PROJECT LEADER

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).
West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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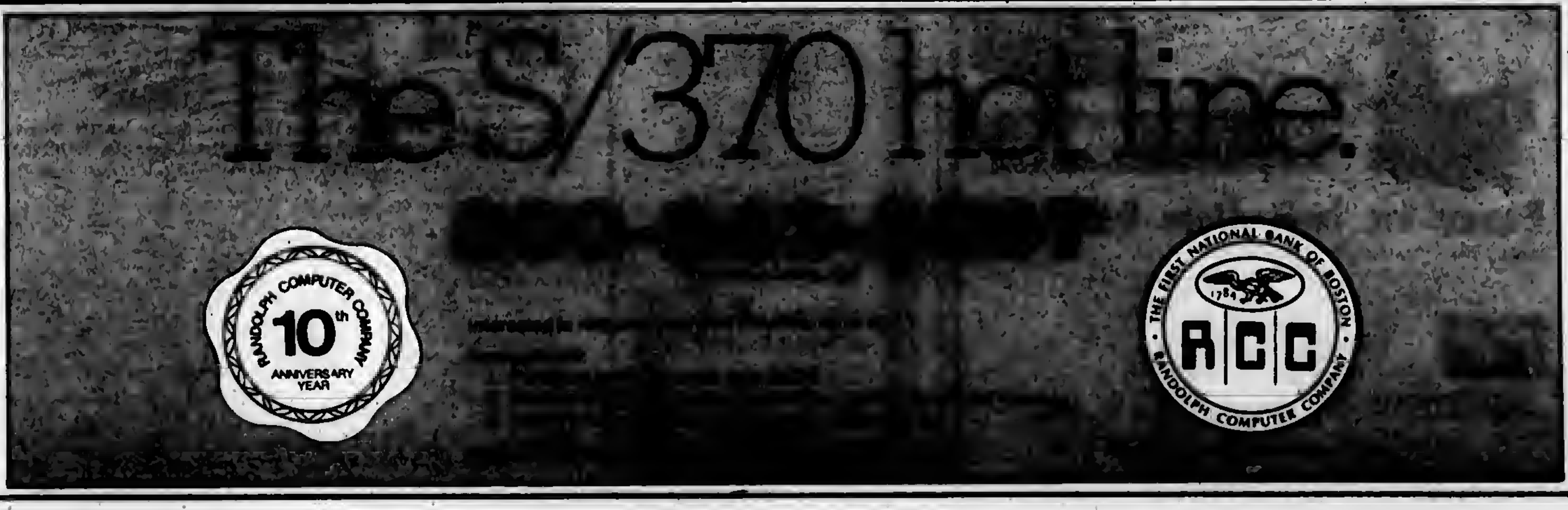
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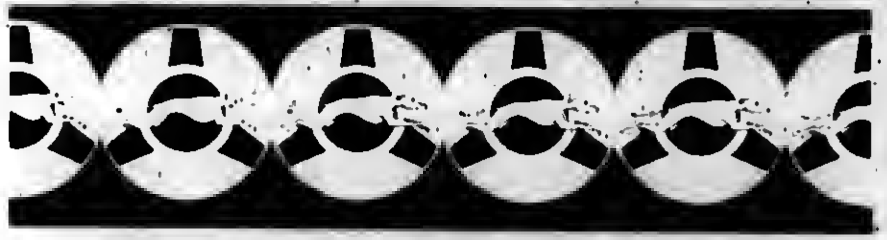

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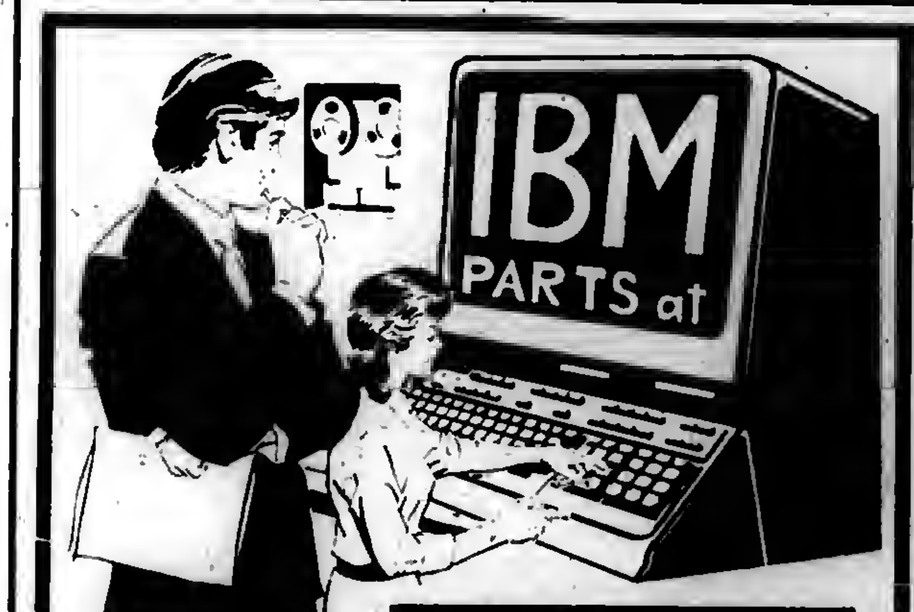

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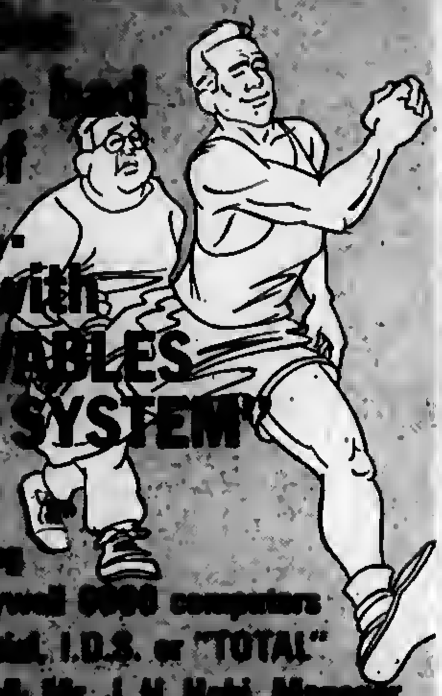

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Pertec Sets Records in Last Nine Months

EL SEGUNDO, Calif. –Pertec Corp. reported record earnings and revenues for the nine months ended March 26, the close of Pertec's 1976 fiscal year.

Although revenues rose 15% in the Peripheral Equipment Division, the Business Systems Division experienced a downturn in revenues.

For the company, revenues rose 6% to $36.7 million compared with $34.5 million for the same period last year.

Earnings totaled $2.5 million or 78 cents a share compared with $1.8 million or 59 cents a share in the same 1975 period.

The results do not reflect the acquisition ot Computer Machinery Corp. (CMC) on March 30, the firm said.

During the last quarter, Pertec revenues dropped to $11.1 million compared with $13 million in the same period last year.

Earnings dipped to $858,000 or 27 cents a share compared with $859,000 or 28 cents a share in the same year-ago quarter.

Regarding the downturn by the Business Systems Division, Pertec President Ryal Poppa said, "As we indicated in our first- and second-quarter reports, we had anticipated a downturn in sales to occur in the latter part of the year, accompanied by a consequent reduction in the level of profitability. This downturn occurred as expected.

"Most of the negative impact on earnings will occur in the first two quarters of fiscal 1977. On the brighter side, we now see signs of recovery and are expecting a return to a higher level of profitability in the latter part of fiscal 1977" in the Business Systems Division, he said.

"For some period of time we have been concerned about the Business Systems Division and its reliance on a few major customers. The acquisition of CMC provides Pertee with an in-place, end-user marketing organization and service force which will help reduce the dependence of the Business Systems Division on a few large private-label contracts," he said.

"We are now more able to control our own destiny in the end-user marketplace, which we believe will stabilize the future of the division and enhance the future growth of Pertec."

Decision Data Sees Poor Half-Year As '75 Losses Total $8.4 Million

HORSHAM, Pa. – While forecasting losses during the first and second quarters of 1976, Decision Data Computer Corp. revealed an $8.4 million loss for 1975.

That figure included $7.5 million in losses of a nonrecurring nature, such as adjustments in depreciation rates, inventory reservcs and other write-offs, the firm said.

The $8.4 million loss, or $2.25 a share, compared with earnings of $1.5 million or 40 cents a share in 1974.

Revenues during the year slipped to $39.7 million compared with last year's $40.6 million.

Winfield Shiras, acting chief executive officer, said the general economic recession of 1975 brought about a significant reduction in sales to OEMs and was the major factor in the company's unfavorable results, both for last year and the first part of 1976.

The company has had to reduce manufacturing operations, he added.

Shiras predicted a loss of about $1 million for the first quarter ended Feb. 28, 1976, as well as a loss for the second quarter.

"Despite the severe setbaek, the company is on a course which will lead to improved operating results by the end of the year," Shiras stated.

The firm's banking group has agreed, subject to final documentation, to advance $2.1 million for working capital requirements as part of the restructuring of the company's loan commitment.

Milgo Electronic Net Cut in Half Compared With 1975 Six Months

MIAMI – Milgo Electronic Corp.'s earnings dropped in half for the second quarter and six months compared with those of the year-ago periods ending March 31.

For the quarter, earnings declined to $545,000 or 31 cents a share compared with $1.2 million or 73 cents a share in the year-ago period.

Revenues were down to $9.8 million compared with $10.6 million in the same 1975 quarter.

The firm attributed the decrease in volume in the quarter to lower incoming orders as a result of the decline in general business activity.

Modem business lags behind the general computer industry, a spokesman said.

For the six months, Milgo's earnings fell to $905,000 or 52 cents a share compared with $2.4 million or $1.44 a share in the same period last year.

Revenues dropped to $18.9 million compared with $20.8 million a year ago.

Acquisitions

United Telecommunications, Inc. has agreed in principle to acquire Standard Computer Corp. (SCC) for 227,500 shares of common. United Telecom plans to integrate SCC operations with those of United Computing Systems, Inc. and International Timesharing Corp.

Data Devices International, Inc. has acquired Insphere, Inc., a manufacturer of disk cartridge maintenance equipment. The transaction was for cash and Insphere will be operated as a wholly owned subsidiary.

Globe Ticket Co. has acquired the Continuous and Snapout Forms Division of Florida Forms, Inc.

Nickles & Dimes

$$$

Comshare has obtained a $2.65 million loan agreement with the National Bank of Detroit, of which $1.3 million is a revolving credit; the remainder is a term loan.

$$$

Wabash Magnetics shareholders have approved a change in the name to Wabash; Bradford Computer & Systems, Inc. has changed its name to Bradford National Corp.

$$$

Creditors of Western Digital have granted the firm a 30-day moratorium on payment of trade debt and appointed a seven-member creditors committee.

$$$

Burroughs will pay a quarterly dividend of 17 cents on each share of common payable Aug. 7 to shareholders of record July 9.

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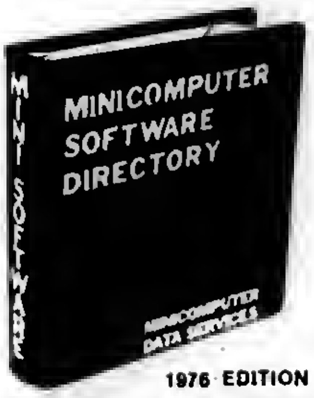

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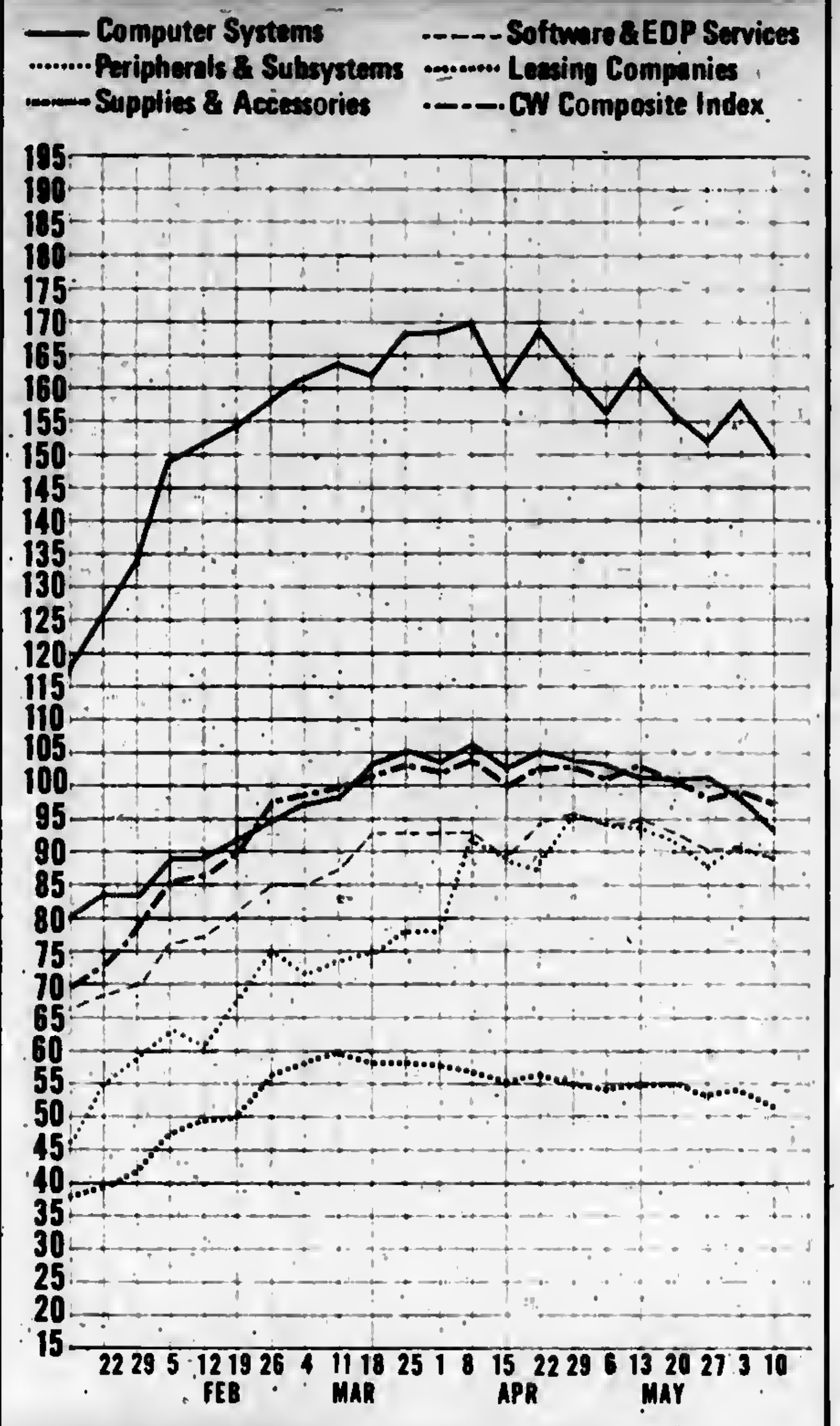

Earnings Reports

BASF AG
Year Ended Dec. 31

	1976 (000)	1975 (000)
Revenue	7,096,400	8,673,400
Earnings	147,900	204,600

a-Dollar figures computed at the mark's current rate.

BOOTHE COMPUTER
Three Months Ended March 31

	1976	1975
Shr Ernd	$.18	$.02
Revenue	12,069,000	9,589,000
Disc Op	.....	111,000
Earnings	697,000	59,000

BRADFORD COMPUTER & SYSTEMS
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.26	$.24
Revenue	18,686,000	17,200,000
Earnings	1,055,000	964,000

a-Restated to reflect retroactive increase in franchise tax rates.

BUNKER RAMO
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.02	.....
Revenue	b83,293,000	$71,745,000
Tax Cred	515,000	.....
Earnings	807,000	(383,000)

a-Restated to reflect accounting change for foreign currency translations. b-Includes about $10 million credit from sale of system to the National Association of Securities Dealers in February 1976.

CODEX
Three Months Ended March 31

	1976	1975
Shr Ernd	$.50	$.73
Revenue	6,730,005	6,237,341
Earnings	788,572	1,106,544
6 Mo Shr	.78	1.45
Revenue	11,613,341	12,329,210
Earnings	1,233,050	2,183,201

COGNITRONICS
Year Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.34
Revenue	$3,691,929	4,942,656
Tax Cred	.....	244,000
Earnings	($75,189)	507,841

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 9, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	94	-3	-3.0
O	COMPUTER AUTOMATION	10- 19	13 3/4	-1	-6.7
N	CONTROL DATA CORP	18- 27	20	-1 1/8	-5.3
N	DATA GENERAL CORP	40- 60	48 5/8	- 7/8	-1.7
O	DATAPOINT CORP	24- 45	36 1/4	-1 1/4	-3.3
O	DIGITAL COMP. CONTROL	2- 4	3 3/4	+ 1/8	+3.4
N	DIGITAL EQUIPMENT	138-181	156 1/8	-7 3/8	-4.5
N	ELECTRONIC ASSOC.	2- 5	3	- 1/8	-4.0
A	ELECTRONIC ENGINEER.	7- 16	10 1/2	-4 7/8	-31.7
N	FOXBORO	28- 43	40 1/2	-1 7/8	-4.4
O	GENERAL AUTOMATION	5- 11	6 3/4	-1	-12.9
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	104 5/8	-3 3/8	-3.1
N	HONEYWELL INC	34- 56	42 3/4	- 5/8	-1.4
N	IBM	227-272	253 1/4	-4 1/4	-1.6
O	MANAGEMENT ASSIST	1- 3	1 7/8	- 1/4	-11.7
O	MEMOREX	18- 33	24	-4	-14.2
O	MICRODATA CORP	10- 26	19 3/8	+ 3/4	+4.0
O	MODULAR COMPUTER SYS	9- 13	11 1/2	0	0.0
N	NCR	24- 31	30 3/4	+2 3/8	+8.3
O	PRIME COMPUTER INC	4- 11	8 1/4	-1	-10.8
N	PERKIN-ELMER	19- 27	20 1/2	-1 3/8	-6.2
N	RAYTHEON CO	45- 56	55 5/8	+ 5/8	+1.1
N	SPERRY RAND	40- 50	46 5/8	- 3/8	-0.7
O	SYCOR INC	20- 31	24	- 1/2	-2.0
A	SYSTEMS ENG. LABS	6- 10	8 1/8	+ 1/8	+1.5
N	VARIAN ASSOCIATES	13- 17	13 3/8	- 7/8	-6.1
A	WANG LABS.	11- 20	11 5/8	- 1/8	-1.0

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	5 1/4	- 1/2	-8.6
A	COMMERCE GROUP CORP	2- 3	2 3/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	1 7/8	+ 1/8	+7.1
N	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	3/4	0	0.0
N	DPF INC	5- 7	5 5/8	0	0.0
A	GREYHOUND COMPUTER	3- 8	7	- 1/8	-1.7
N	ITEL	6- 13	11	- 1/2	-4.3
N	LEASCO CORP	6- 14	11	- 3/4	-6.3
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	1- 1	1/2	0	0.0
A	PIONEER TEX CORP	4- 9	7 1/4	- 3/8	-4.9
N	U.S. LEASING	7- 12	8 3/4	- 1/2	-5.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/4	0	0.0
O	ANACOMP INC	9- 11	9	- 1/8	-1.3
A	APPLIED DATA RES.	2- 3	2 5/8	- 1/8	-4.5
N	AUTOMATIC DATA PROC	54- 68	66	-1 1/8	-1.6
O	COLEMAN AMERICAN COS	4- 6	3 1/2	0	0.0
O	COMPUTER DIMENSIONS	3- 7	4 3/4	- 3/8	-7.3
O	COMP ELECTION SYSTMS	5- 9	8 1/4	+ 1/2	+6.4
O	COMPUTER HORIZONS	1- 2	3/4	0	0.0
O	COMPUTER NETWORK	2- 6	4	- 1/4	-5.8
N	COMPUTER SCIENCES	4- 8	5 7/8	- 3/8	-6.0
O	COMPUTER TASK GROUP	1- 1	1 3/8	0	0.0
O	COMPUTER USAGE	3- 6	3 7/8	+ 5/8	+19.2
O	COMSHARE	2- 8	7 3/4	+ 1/4	+3.3
O	DATA DIMENSIONS INC	2- 4	3 1/4	- 1/4	-7.1
O	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	11 7/8	- 3/8	-3.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	2 1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1	0	0.0
O	KEANE ASSOCIATES	2- 4	3	0	0.0
O	KEYDATA CORP	3- 5	2 5/8	0	0.0
O	LOGICON	4- 4	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/4	0	0.0
A	NATIONAL CSS INC	13- 25	18 1/2	-1 1/4	-6.3
A	ON LINE SYSTEMS INC	18- 22	17 7/8	-1 3/8	-7.1
N	PLANNING RESEARCH	3- 5	3 1/4	- 1/8	-3.7
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	2 5/8	- 1/8	-4.5
O	REYNOLDS & REYNOLD	13- 21	17	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	19- 28	23 1/2	-2 3/8	-9.1
A	URS SYSTEMS	3- 5	3 7/8	- 1/8	-3.1
N	WYLY CORP	3- 7	3	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	8 3/4	- 1/8	-1.4
O	ADVANCED MEMORY SYS	4- 10	7	0	0.0
N	AMPEX CORP	5- 8	7 1/4	0	0.0
O	ANDERSON JACOBSON	2- 4	3	0	0.0
O	APPLIED DIG DATA SYS	13- 24	23 1/2	+1	+4.4
O	BEEHIVE MEDICAL ELEC	3- 8	7 1/2	+1 1/4	+20.0
A	BOLT, BERANEK & NEW	7- 10	8 1/4	0	0.0
N	BUNKER-RAMO	5- 7	5 7/8	0	0.0
A	CALCOMP	4- 7	4 1/2	0	0.0
O	CAMBRIDGE MEMORIES	2- 6	3 1/8	- 1/8	-3.8
N	CENTRONICS DATA COMP	20- 36	29 7/8	+1 1/4	+4.3
O	CODEX CORP	22- 42	30	-5 1/2	-15.4
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 5/8	0	0.0
O	COMPUTER CONSOLES	4- 7	6 1/4	- 1/4	-3.8
A	COMPUTER EQUIPMENT	1- 3	1 3/4	- 1/4	-12.5
O	COMPUTER TRANSCEIVER	1- 3	1 1/8	- 1/8	-10.0
O	COMTEN	4- 9	6 1/4	- 5/8	-9.0
N	CONRAC CORP	20- 25	20 1/2	- 7/8	-4.0
O	DATA ACCESS SYSTEMS	1- 4	3 1/2	- 1/4	-6.6
O	DATA 100	7- 13	9 7/8	- 1/2	-4.8
A	DATA PRODUCTS CORP	5- 11	9 1/4	0	0.0
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC	1- 2	2 1/8	+ 1/8	+6.2
O	DECISION DATA COMPUT	1- 4	1 7/8	+ 1/8	+7.1
O	DELTA DATA SYSTEMS	1- 1	5/8	+ 1/8	+25.0
N	ELECTRONIC M C M	1- 3	2 3/8	- 1/8	-5.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 1/4	- 5/8	-6.3
N	HARRIS CORP	34- 48	44 1/2	- 3/8	-0.8
A	INCOTERM CORP	9- 20	9 7/8	- 3/8	-3.6
O	INFOREX INC	3- 7	4 3/8	- 1/8	-2.7
O	INFORMATION INTL INC	10- 18	13 5/8	- 7/8	-6.0
O	INTEL CORP	65-109	66	-3	-4.3
A	LUNDY ELECTRONICS	4- 7	3 7/8	- 3/4	-16.2
O	MSI DATA CORP	3- 7	5 1/2	- 1/8	-2.2
A	MILGO ELECTRONICS	15- 20	19 1/2	- 3/8	-1.8
N	MOHAWK DATA SCI	3- 7	6 1/4	+ 1/4	+4.1
O	PENRIL CORP	1- 3	2 1/8	0	0.0
A	PERTEC CORP	3- 8	5	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	+ 1/2	+11.1
O	QUANTOR CORP	4- 5	4	- 1/8	-3.0
O	RECOGNITION EQUIP	6- 11	8	- 7/8	-9.8
N	SANDERS ASSOCIATES	6- 11	8 3/4	- 1/2	-5.4
O	SCAN DATA	2- 4	2 1/4	- 1/8	-5.2
O	STORAGE TECHNOLOGY	9- 13	10 3/4	-1	-8.5
O	T BAR INC	5- 10	4 7/8	-1 1/4	-20.4
O	TALLY CORP.	4- 6	5 1/8	+ 1/8	+2.5
O	TEC INC	3- 5	3 3/4	- 1/4	-6.2
N	TEKTRONIX INC	45- 63	56	-3 5/8	-6.0
N	TELEX	2- 5	3 1/2	- 1/2	-12.5
O	WANGCO INC	11- 22	18	- 7/8	-4.6
O	WILTEK INC	2- 2	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUNE 9 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	2 1/4	- 1/4	-10.0
O	BALTIMORE BUS FORMS	4- 5	4	0	0.0
A	BARRY WRIGHT	6- 10	8	- 1/8	-1.5
O	CYBERMATICS INC	1- 1	3/4	0	0.0
A	DATA DOCUMENTS	33- 42	33	-2 1/4	-6.3
O	DUPLEX PRODUCTS INC	15- 24	14 3/4	-2	-11.9
N	ENNIS BUS. FORMS	6- 8	6 3/4	- 1/4	-3.5
O	GRAHAM MAGNETICS	8- 13	8 1/4	- 1/2	-5.7
O	GRAPHIC CONTROLS	13- 19	14	- 1/2	-3.4
N	3M COMPANY	53- 65	52 1/2	-2 1/2	-4.5
O	MOORE CORP LTD	42- 51	40 1/2	-2 1/2	-5.6
N	NASHUA CORP	11- 17	14 3/4	-1 1/4	-7.8
O	STANDARD REGISTER	16- 19	16	- 1/2	-3.0
O	TAB PRODUCTS CO	5- 8	7 3/4	+ 1/4	+3.3
N	UARCO	21- 25	21 1/4	+ 1/2	+2.4
O	VANIER GRAPHICS CORP	5- 8	6 3/8	- 1/4	-3.7
A	WABASH MAGNETICS	4- 8	6 1/8	0	0.0
N	WALLACE BUS FORMS	19- 25	19 3/4	-1 1/4	-5.9

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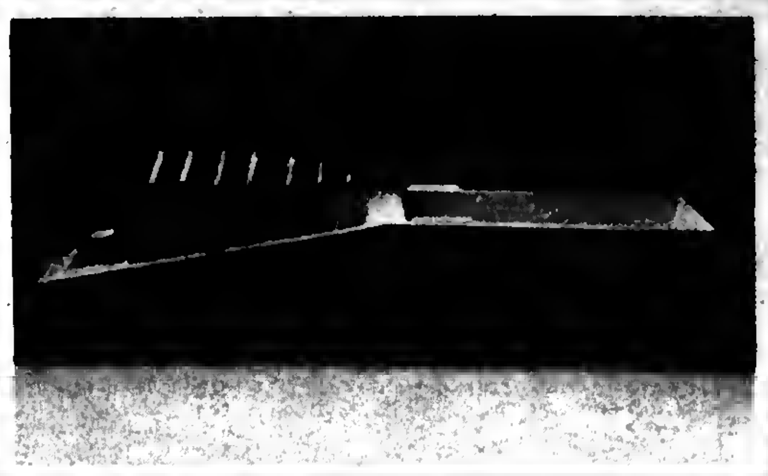

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper
Second-class postage paid at Boston, Mass., and additional mailing offices
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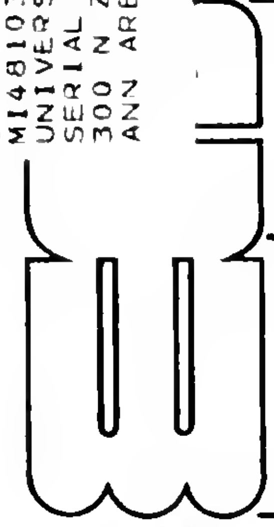
ear
June 21, 1976
Vol. X, No. 25

NEWSPAPER



House To Hear Bell Bill

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Hearings on the Consumer Communications Reform Act of 1976 have been scheduled by the House Communications Subcommittee and will tentatively be held early this fall.

Three days of hearings on the proposed legislation will probably be held "late in September," according to a subcommittee spokesman. Although an official list of those who will appear has not yet been drawn up, common carriers will obviously testify since they are directly affected by legislation, the spokesman said.

It is also possible users will be given the opportunity to testify, he said, and those who are interested in providing their positions to the House subcommittee should contact Andrew Margeson, B-331, Rayburn House Office Building, Washington, D.C. 20515.

This is the fourth in a series of articles describing the efforts being expended behind the scenes to inform Washington legislators and others about the pros and cons of the Consumer Communications Reform Act of 1976, now pending in both houses of Congress.

While hearing plans are going forward in the House, there are no formal hearing dates in the Senate. The Senate's Communications Subcommittee has not made a commitment with regard to hearings on the Consumer Communications Reform Act and, a spokesman said, "it is really speculative to talk about the shape of any hearings or when they would come."

Asked whether users will have an opportunity to testify, the spokesman said Sen. Warren Magnuson (D.-Wash.) of the Senate Commerce Committee had stated that "all interested parties will receive a full and fair hearing." The communications group is a part of the Commerce Committee.

Asked how witness lists would be compiled when hearings are held, the Senate subcommittee spokesman said interested parties who had previously corresponded with the Federal Communications Commission (FCC) on the issue of competition would probably be contacted. But users interested in appearing or making their views known should write directly to the subcommittee, he said.

While the House group apparently will hold three days of hearings, most congressional experts agreed there is little time left in the current session for any detailed hearings on the act. They foresee an extensive debate on the bill and its issues in both houses of Congress beginning early next year.

Complicating the issue is the fact that the House subcommittee has a new chair-

(Continued on Page 6)

Congress Halts Bidding

SSA Doesn't Need More DP: GAO Audit

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The General Accounting Office (GAO) has finally released its audit of the Social Security Administration's (SSA) computer operations which indicates the agency's DP needs can be met by its existing facilities [CW, April 26].

And, as a result of the report, congressional pressure has delayed until mid-July the SSA's plans to award bids of up to $48 million for construction of a $69 million computer facility and an office building known as "Metro West."

Besides concluding the SSA plans for expansion are unnecessary, the GAO audit said the SSA failed to consider all available alternatives for expanding its DP operation in accordance with the specifications of the National Environmental Protection Act, recent correspondence between the GAO, Commissioner of Social Security James B. Cardwell and Rep. Charles A. Vanik, chairman of the Subcommittee on Oversight for the House Committee on Ways and Means, indicated here.

Sometime in the next three weeks, the House Government Operations Intergovernmental Relations and Human Resources Subcommittee, chaired by Rep. L.H. Fountain, will hold hearings to reevaluate the SSA's building and expansion plans, already approved by Congress.

Working at Half of Capacity

The correspondence between the GAO and the SSA which precipitated this reevaluation began with a March 26 letter from Gregory J. Ahart, director of the GAO's Manpower and Welfare Division, to Cardwell, providing the SSA commissioner with a draft summary of the GAO audit of the SSA's computer operations.

That audit indicated that, even on its busiest days, the agency's large-scale computer systems were being used at less than 50% of their available capacity.

In its explanation of the basis for these findings, the draft indicated GAO audi-

(Continued on Page 4)

FBI Asks End to CCH Plan, Cites Rebuff of Switching

By Nancy French
Of the CW Staff

SAN ANTONIO, Texas – The Federal Bureau of Investigation (FBI) has requested permission to terminate its Computerized Criminal History (CCH) program because information exchange cannot work effectively without a message-switching capability, U.S. Attorney General Edward H. Levi said in a speech here recently.

The FBI was denied permission to implement that capability by Levi last fall after congressional critics and others expressed fear that the message-switching system would concentrate too much police power within the FBI [CW, Nov. 19].

The CCH is a computerized file of criminal histories maintained by the FBI as part of its National Crime Information Center.

Deputy Attorney General Harold Tyler and the Justice Department's Telecommunications Systems Policy Board are studying the FBI request, but no one could estimate when a decision might be reached, a Justice Department spokesman said last week.

The CCH system was intended to centralize information on multistate offenders in a data bank in Washington, D.C. Records on single-state offenders would have been maintained by the states and the message-switching system, tied in with an index, would have switched inquiries from a requesting state to the

(Continued on Page 5)

User Claims His Univac 90/60 Can't Compare With Spectra 70

By Molly Upton
Of the CW Staff

TROY, Mich. – A user of a Univac 90/60 here is unhappy. Very unhappy.

"One does expect some problems in the beginning with new equipment, but this is a calamity," Peter J. Maraveleas, president of Medical Ancillary Services, Inc. (MAS), said recently.

The 90/60 cannot begin to keep up with the volume of work MAS processed on its RCA Spectra 70, he claimed. The problem is basically with the hardware, he said, although the Univac software is "lousy."

One of the principal faults of the system is the lack of software to provide for deleting items from files, he added.

Citing 70% downtime, Maraveleas has asked Univac to institute a trust fund so his clients can meet their payrolls because all their accounts receivable are "locked into" Univac computers.

Commenting on a letter Maraveleas sent to a Univac vice-president, a Univac spokesman said, "We have received Mr. Maraveleas' letter, which we think is somewhat colorful, and we are working with him to investigate and, if necessary, resolve the issues he brings up."

MAS, which services hospitals and physicians, said it has lost several clients.

Maraveleas suspects the machine was released before Univac people outside of the top technical staff knew how to maintain it, he said.

Univac recently sent some design engineers here, and they are "making a big difference."

But MAS has been having difficulty with its 90/60 since February, Maraveleas said. The system was installed last September and ran in parallel with the Spectra 70 until January.

The firm spent two and a half years converting programs to the machine

(Continued on Page 3)

Money-Saving Device Not for Sale

By John P. Hebert
Of the CW Staff

SAN JOSE, Calif. – IBM has an experimental power-switching device that could save users money on certain types of leased equipment and conserve some of the nation's energy – but the firm has no plans to manufacture or market it.

The "remote power control station" switch was developed and is currently being used in an IBM 370 installation at IBM's Product Test Laboratory here. However, it is "strictly an internal [company] device that we're playing with," an IBM General Products Division spokesman said.

With the device, IBM said, an operator can switch power selectively to peripheral equipment, turning on only those machines needed for a given job.

Toggle switches on a small, boxlike station are connected to power control cables individually serving the various machines, such as tape drives, card readers and card punches, it said.

The power-switching device acts as an intermediary between the peripherals and the CPU, which is the single source from which all power control signals emanate, it added.

An estimate of reduced energy consumption for an eight-hour shift in the lab here "adds up to something over 100 kilowatt hours," the spokesman said.

Asked what the effect from any similar device introduced into the marketplace would be on IBM's Monthly Availability Charge (MAC) plan, an IBM spokesman at the Data Processing Division in Armonk, N.Y., said no specific answer could be given because of the "many variables" presented by the fact it was an experimental device.

The MAC plan allows for a minimum usage of 178 hour/mo on the CPU and some peripheral equipment at a standard rate. The user is billed for any time the equipment is used beyond that point.

And, hypothetically, if such a device were introduced, the corporation would have to assess each peripheral individually at that time, he said.

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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. **W. Germany:** Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. **Asia:** Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101 Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy: $15 a year in the U.S., $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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Calls Documents 'Smoking Gun'

U.S. vs. IBM Witness Says Never Again

By Edith Holmes
Of the CW Staff

NEW YORK – "No, I wouldn't testify if I had it to do all over again," Larry Welke, president of International Computer Programs, Inc. (ICP), said here recently about the part he played as a witness for the U.S. government in the trial of its antitrust case against IBM.

"I went into court thinking I would make a contribution that would benefit the judge in his understanding of the issues involved," Welke said. "I feel now that I misunderstood the purpose of a witness in that trial.

"Everyone is looking for a smoking gun. If this case has one, it's in the documents; it's not in the hand of any witness."

The 29th person to appear in court and take the stand on behalf of the Department of Justice, which is prosecuting the government's case, since the trial began over a year ago, Welke said he was asked and agreed to participate as a witness with little or no preparation.

Not knowing the rules or conformities governing the actions of the parties, the judge and a witness, the ICP president said he felt frustrated while on the stand and "used" by the time it was all over.

A witness "merely serves as a conduit for both sides. The parties simply use the witness to carry their particular message to the judge," he added.

While Judge David N. Edelstein, who is hearing the case without a jury, "made a point of telling me I was my own man with no obligation other than to tell the truth," Welke said the judge seemed to have no sense his behavior and expections could affect a witness and the quality of his testimony.

More Preparation by IBM

Though he was the government's witness, "IBM probably did more to prepare me than the Department of Justice did," Welke said. He described his lack of preparation as "probably the principal shortcoming" of his participation in this action.

The Justice Department did little more than tell Welke to wear a white shirt, a conservative tie and to look neat, and the ICP president said he had to ask for even that advice.

By contrast, IBM counsel suggested he review depositions he gave in June 1974 and again in September 1975.

Welke noted that, following his initial examination by the government in court, attorneys for the defense pointed out contradictions between his testimony before the judge and his deposition testimony.

"IBM counsel never told me to review the contradictory passages in my depositions; it just suggested it might be helpful," Welke recalled, adding "that's the kind of thing you might think the Department of Justice should have done."

Welke pointed out other differences between the preparation offered him by the government and that provided by IBM. Each day, both parties would go over the questions they planned to ask him in court.

"If IBM counsel didn't like my response to a question during these sessions, it wouldn't ask me that question once I was on the stand," Welke said. But the Justice Department attorneys asked him the same questions on the stand that Welke had answered to their dissatisfaction in the preparation meetings, he noted.

"The government people never said directly they didn't like my responses to some of their questions," he said, "but that was obvious both in the preliminary meetings and in court because they kept coming back to the same subject area and asking the questions again in slightly different ways."

Welke thinks the Justice Department questions were sometimes unclear, he said, because they were questions handed up to the government attorney conducting the examination by Alan McAdams, the economist consulting the Department of Justice in this case.

From everything he saw, Welke said, he thinks "McAdams is running the strategy for at least this part of the trial."

In conversations incidental to his participation as a witness, the ICP president said he feels the government's overall strategy in regard to witnesses is "to keep them on the stand for a long enough time so the judge will get to know them well – at least well enough to believe their opinions about the computer industry."

Welke also commented on the Justice Department plan to have McAdams take the stand as its final witness. He learned McAdams will use all prior testimony to justify his testimony before Edelstein.

"McAdams will be like the pitcher who comes up to bat at the end to win his own ball game," he said.

An observer watching the proceedings while Welke was on the stand remarked on his lack of preparation. "You know, these people are being asked to come do their civic duty by giving a pint of blood. Then they get on the stand and they're asked to donate a kidney. That's an entirely different matter," the observer said.

Court Paves Way for FCC Plan Eliminating DAA Requirement

By Ronald A. Frank
Of the CW Staff

ABBINGTON, Va. – A U.S. Court of Appeals ruling made here last week will allow users to directly connect noncarrier data communications equipment to the telephone network.

A three-judge panel of the U.S. Fourth Circuit lifted an earlier stay order which had blocked the start-up of a Federal Communications Commission (FCC) program to connect customer-provided equipment without Bell Data Access Arrangements (DAA) [CW, May 10].

The latest ruling means users will be able to connect noncarrier equipment, such as modems, to the network if the equipment has been certified by an independent engineer and registered with the FCC.

The certification/registration procedure was designed to ensure customer-provided equipment contains protective circuitry generally equivalent to that contained in the DAA. This circuitry prevents electrical harm from occuring to the network.

An FCC spokesman said certified and registered devices can be connected to the network almost immediately – as soon as the commission issues the necessary order putting the interconnection program into effect.

The Bell System has fought a long regulatory and legal fight to prevent direct connection of customer-provided equipment to the telephone network.

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Data Entry Backlog Cited in Death of Motorcyclist

By Nancy French
Of the CW Staff

WORCESTER, Mass. – A high-speed police chase ended in death here recently for a teenager riding on what was thought to be a stolen motorcycle.

When it was all over, however, authorities found the cycle had been legally registered three weeks earlier, but the record had not yet been entered into the Registry of Motor Vehicles' computer system.

The registry uses a keypunch data entry system, and has a backlog of at least three weeks, according to Morton Carter, a registry spokesman.

Besides the fact that information about the current registration was not available to police officers in their patrol car, a report from the state's telecommunications network told them a Honda cycle with the same registration number had been stolen in 1973 and never recovered.

It was almost midnight when police in a squad car saw 18-year-old Scott Elms of nearby Holden ride his motocycle through a red light on Main Street, according to their report. Police radioed the vehicle's license number to a dispatcher at the Worcester Police Department who queried the Law Enforcement Agency Processing System (Leaps) operated by the state's Department of Public Safety.

The Leaps inquiry accessed the state's missing persons/stolen property data base as well as the Department of Motor Vehicles' computerized files, according to Deputy Halstead Taylor, spokesman for the Worcester Police Department.

The Leaps data base reported a Honda similar to the one Elms was riding had been stolen in 1973. However, the registry file indicated Elms' registration number had last been issued in 1974 and no current registration was listed.

"People made telephone calls to the agency that reported the vehicle stolen, but apparently didn't get any answer – it's a gray area on my report," Taylor said.

But everything else seemed to fall into place, he said. "It was a Honda, it was reported stolen and a guy was trying to get away from us," he said. "The net result was that we had to take the thing as gospel, especially when we were in the middle of a chase."

The information was radioed to the squad car, which continued to pursue the fleeing motorcycle. The chase ended in Holden, where Elms went off the road, crashing into a utility pole.

The youth was pronounced dead on arrival at Holden District Hospital, the police report said.

A day and a half later Worcester police learned Elms had a valid registration, but it wasn't found until registry personnel manually searched their files.

Taylor said he didn't understand why the registry doesn't have data entry facilities in each district or regional office so registrations can be entered as soon as they are received.

User of Univac 90/60 Unhappy

(Continued from Page 1)

under the supervision of Univac, Maraveleas said.

The programs work, he added, because they were thoroughly tested individually before the cutover was made. The system survived the parallel operation because there wasn't much of a workload on it, he said.

In February, MAS' system was down for 17 days. Univac doesn't know what was wrong with it, Maraveleas said, but it replaced the controller and that seems to have helped.

To extricate MAS from its bind, Univac offered to put some of MAS' work on its two 90/60s in Blue Bell, Pa. But "all three machines are unable to compete with one lousy Spectra 70," he said.

Univac represent the 90/60 as being able to process in 10 hours a day the work it took the Spectra 70 16 hours a day to do, according to Maraveleas.

However, he said in the letter to Univac Vice-President Charles Grunman, "reality demonstrates that a 90/60 on my premises and a 90/70 located at your service center in Blue Belt, both operating seven days a week, 24 hours a day, are not able to accomplish what the Spectra performed on a 16 hour per day, five days a week schedule."

Also, Univac told him there would be other 90/60 users in Michigan, but these failed to materialize, Maraveleas stated.

By March, Univac indicated additional memory and a disk drive would improve output, he said. But the disk drive did not become operational until May 12 and the additional memory was disconnected because it was "inoperable," he said.

Then Univac determined an upgrade to a 90/70 with four channels was needed. This machine was supposed to have been installed in late May, he said, adding the computer room was expanded to accommodate the system at considerable cost to meet the date given by Univac.

Recently, the team in Blue Bell working on the MAS situation unloaded half of the data base and reloaded it after cleaning the dead accounts. A job that was to have taken 60 hours took 10 days because of hardware failures, Maraveleas said.

The cleaner base has improved the system's speed, he observed, and the same procedure is being done here.

In his letter to Grunman, Maraveleas asked, "Do you call reasonable hardware stability: 70% downtime for five consecutive months, the substandard performance of two computers located at Blue Belt and one on site at this company?

"Do you call reasonable software capability: the continuous restoring of and nothing more when, by the grace of God, one out of three computers is functioning?

"Do you call software efficiency the inability to delete records under any circumstances?"

As consequences of difficulties with the 90/60, Maraveleas said, MAS has incurred loss of new prospects, loss of existing clients, paralysis of MAS management and systems department, demoralization and exhaustion of personnel and a 400% increase in MAS' accounts receivable, resulting in the total depletion of his firm's resources.

Maraveleas is unaccustomed to downtime – the Spectra 70 was down only about four hours in five years, he said.

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Audit Finds SSA Plans to Expand DP Not Warranted

(Continued from Page 1)

tors, working with independent consultant Mike Morris and Boeing Computer Sytems' System Analysis and Resource Accounting package, determined 11 of the agency's 13 IBM 360/65s "are capable of handling more than twice the load that is currently assigned."

SSA system management information was unusable for the remaining two 360/65s, it noted at the time. However, information GAO later received indicated they, too, could sustain a similarly increased workload.

As with the 360/65s, the GAO audit draft stated the agency's two 370/65s and two 370/168s could also support more than double their current workload.

"Only in the case of the 165s would any reduction in present abend rates be needed to double the total load," the draft said.

In addition to these conclusions, the GAO noted, "the large-scale systems are evidently only manned for 15 of the available 21 shifts per week, although some of the available six shifts on Saturday and Sunday are worked in a few of the complexes.

"These unmanned shifts represent an additional reserve capacity of up to 40% for all systems."

Reasons for Underutilization

Why such underutilization? The analysis led the GAO to conclude "the entire structure of the operation is tailored as though the systems in use were of the [IBM] 7090-1410 or 'Second-Generation' series."

The auditors said they noted "an extreme lack of knowledge of the capabilities of the equipment, general indifference toward completion of necessary tasks, only superficial understanding of work to be done and virtually no communication between operations personnel from one shift to the next."

The GAO team frequently observed the agency's 17 large-scale systems being placed in a "stop" condition and left unattended by operations personnel. This seemed to be the normal way to change shifts, the GAO commented, noting systems were also stopped to wait for work from other systems.

Organizationally, the system complexes each seemed dedicated to one or very few major users. "This results in almost no sharing of work between complexes, even though one of two adjacent complexes may be extremely busy while the other is completely idle," the GAO said.

The agency's Bureau of Data Processing, "in effect, provides total systems to the user to be used at his discretion rather than providing computer service to all users based on the total of all computer resources available," the auditors stated.

Finally, the draft of the GAO findings noted that, in many cases where the output of the large-scale systems was placed on tape, these tapes were moved to the medium-scale systems to be printed.

"Carrying tapes from one system to another for printing was typical in the late '50s and early '60s; it is a totally unnecessary operation with large-scale systems of the type installed at SSA."

In a response on April 16 to the GAO's conclusions, Cardwell called the GAO and Morris analysis "an indicator of *possible* underutilization of present CPU and/or peripheral equipment."

He suggested that a further analysis of the computer operation be initiated by an outside organization and indicated that "if the job is to be done properly," such an analysis could take as long as a year and a half.

In the meantime, Cardwell told Ahart, the SSA has determined its best choice in acquiring further equipment is to go ahead with plans to install four 370/168s now on order [CW, April 12] in November while concentrating on determining how many of the present 360/65s might be eliminated.

Cardwell promised the agency would initiate no additional significant acquisitions, including those proposed in the 1977 budget, until further analysis of the computer operation is completed.

Because the agency plans to proceed with the acquisition of the four 370/168s, it must also go ahead with the construction of the $2.3 million temporary facility in which to house these machines, the commissioner concluded.

Similary, Cardwell argued, the $69 million computer facility must be built without delay if the SSA is to modernize its DP operations – a process that necessitates "a complete overhaul [of equipment] from top to bottom."

SSA efforts to improve management and staff training and development received the promise of "an outside expert in this general field to come in and work under the associate commissioner for program operations over the next several years to make improvements both in staff development and in the general area of systems management."

Cardwell also said "immediate steps" would be taken to improve physical security and to upgrade the training of security personnel.

Reply From Ahart

On May 14, Ahart responded to Cardwell, hitting hard on the relationship between improving management and staff training and the security of the SSA's DP operations [CW, May 24].

Ahard also challenged the agency's "inadequate" consideration of modifications to its existing DP buildings in lieu of building a new computer facility.

Noting that "industry sources consider incompetency and carelessness of DP personnel to be the most significant threat to the security of a DP installation," Ahart urged the SSA to adopt staff training and development that takes security into account.

"We feel that elimination of such potential security threats cannot be accomplished simply by relocating the entire computer operation to the secure environment of the new building," he said.

While security has been a major justification for building the new computer facility, Ahart said the SSA has been inconsistent in similar concern for its present building, which could be used for four to six more years even if the new building goes through.

In January 1975, the SSA turned down a proposal to install an automated security system in its existing facility at a cost of about $300,000, Ahart recalled.

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Rules No Criminal Intent Evident

Judge Throws Out Indictment Charging IBM Rigged Bid

By Nancy French
Of the CW Staff Staff

JERSEY CITY, N.J. – A Hudson County Superior Court Judge here has dismissed the indictment that charged IBM and five individuals with conspiring to rig the bid for this city's computer system in IBM's favor [CW, Oct. 8].

The law allegedly violated was the New Jersey Public Contracts Law, which became effective in July 1971.

Judge Thomas S. O'Brien found there was no evidence to show criminal intent and ruled the indictment returned last September was fundamentally unfair. He said further the indictment violated due process.

Three former Jersey City officials were involved – Joseph Cahill, finance director; Walter Happell, director of DP services; and Peter Korn, business administrator.

Also indicated were IBM itself; Roger Forsyth, an executive of the First Jersey National Bank who acted as a consultant to Jersey City DP officials on the contract; and Eugene Josephs, an IBM sales representative.

The indictment charged IBM and the five individuals conspired to thwart free, open and competitive bidding in order to win the contract for rental of a computer system. The contract was valued at $13,860/mo.

The indictment also charged Burroughs Corp. and Honeywell Information Systems were excluded from bidding on the system.

Using as part of its evidence a report from the Division of Community Affairs indicating that all DP equipment must be put out to bid, the prosecutor attempted to show the individuals involved intended to violate the law.

IBM counsel, from the firm of Riker, Danzig, Scherer and Debevoise of Newark, used an opinion from the Legislative Services Bureau in Trenton to show services don't have to be competitively bid.

The corporation's counsel also produced as evidence an article from the *New Jersey Law Journal* which called the public contracts law "confusing, ambiguous and hard to apply."

Defense counsel also attacked the indictment in its pretrial brief because, it said, the indictment merely charged the defendants conspired to pervert due administration of the public bidding laws without attempting to show the procurement had to be bid publicly.

The indictment also did not specify how the bidding procedures used failed to comply with the statute, IBM counsel said.

In addition, the counsel showed 59 government entities covered by the public contracts law have awarded computer contracts without competitive bidding since adoption of that statute in 1971. Those that negotiated procurements rather than bidding them ranged from the Bergen County Vocational School in Paramus in 1972 to the John F. Kennedy High School in Willingboro in 1975, the pretrial brief said.

Without going so far as to say the law was "vague," O'Brien indicated there was no evidence to show the officials had clear intent to violate any statute, according to John McLaughlin, a spokesman for the prosecutor's office.

FBI Asks Permission To End CCH Program

(Continued from Page 1)

state where the criminal record was maintained.

However, the FBI began implementing the system by collecting duplicate computerized criminal histories, which drew objections from constitutional rights advocates who saw the system as the beginning of a national police force.

Since its inception, the CCH file has grown to 800,000 records, with eight states participating.

No Action by Congress

It had been Levi's expressed view the constitutional issues raised by the FBI proposal for a message-switching system should be resolved by Congress before he gives the final go-ahead, and thus a decision was deferred.

However, Congress has taken no action on the matter to date – a fact which Levi finds "disappointing," he told a meeting of state attorneys general.

The final decision on the FBI's request to terminate the system will be "difficult because of the potential value of the Computerized Criminal History program and, particularly, because of the steps which some states have taken in reliance upon the development of a national program," Levi said.

"If the [FBI's] request to terminate its program is granted, perhaps a decentralized Computerized Criminal History program will be implemented by another institution," he said.

The National Law Enforcement Telecommunications System (NLETS), a system funded and operated by state law enforcement agencies, has been suggested by some as an alternative.

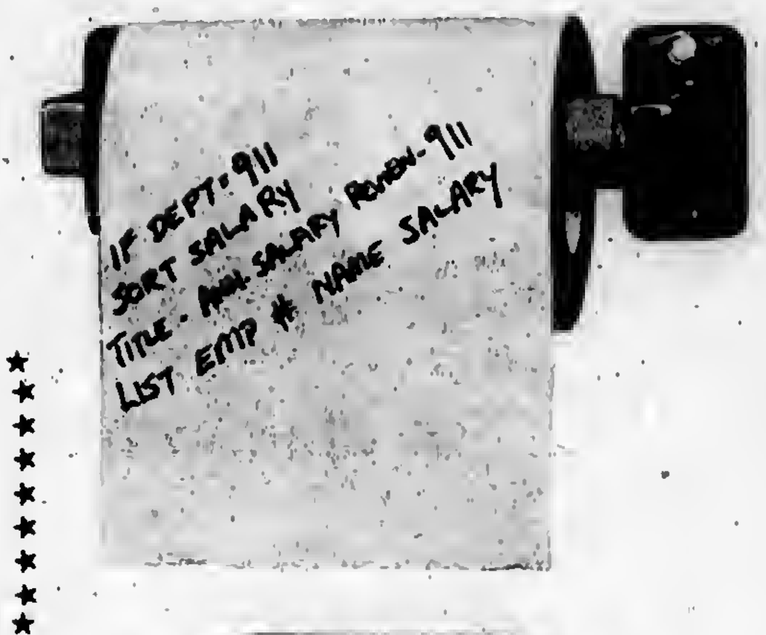
In response to the Levi speech, NLETS President Richard Burns said in an interview the NLETS Board of Directors "is on the record in support of the FBI's maintenance of computerized criminal histories."

However, the group is slated to meet again at the end of this month and recent developments may produce a change in their attitude, Burns said.

Regardless of how the issue is resolved, legislation is important, Levi said.

"Crime is at an intolerable level" and "the victims of crime will be ill-served if, in seeking our common goals, we unnecessarily compete, rather than cooperate, or if we permit inevitable controversies to prevent us from making difficult decisions together," he said.

"Federalism is one of the great inventions of our Constitution, and we have a strategic opportunity and responsibility to make it work," he said.



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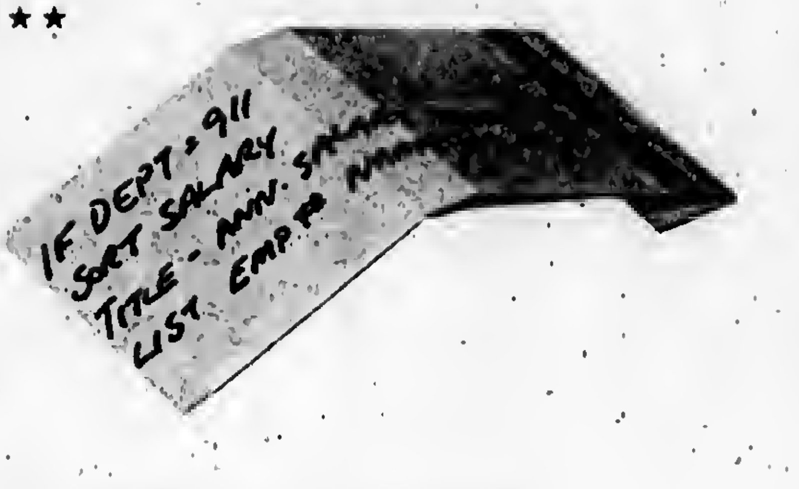

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IBM-Made Punch Cards Blamed in Primary Miscount

By Catherine Arnst
Of the CW Staff

CONCORD, N.H. – An attempt to switch from hand-counted ballots to an automated system resulted in an erroneous vote tally in New Hampshire's Presidential primary, this city discovered recently.

A Computer Election Systems (CES) precinct ballot-counter system tested in one ward here during the February primary miscounted about 29 votes because some of the punch cards manufactured by IBM were cut short..

Concord has been reviewing its voting procedures since the Durkin-Wyman senatorial race that took a year to resolve because of miscounted ballots. The CES system was being tried out in Ward 5 prior to being submitted to the New Hampshire Ballot Law Commission for certification for state use.

"The system was given about as rigorous a test as can be given," Mayor Martin Gross said. "There were 228 positions on a ballot."

But the corner cuts on some of the IBM ballots were not made to the specified size, and the system did not count those ballots at all.

The miscount wasn't discovered until May 14 because part of the test for the system required the ballots be counted on a different system after an impoundment period for the ballots was over.

It was then discovered some of the ballot cards were cut .026 of an inch too short. This resulted in President Gerald R. Ford getting 29 more votes and Ronald Reagan getting 12 more than the original count.

The results of the primary were not affected by the miscount at all, Gross said. Ford went from 227 to 256 votes in the ward and Reagan went from 110 to 122; the delegate count for each remained unchanged.

The short punch cards threw the ballot counter off because the system is set up to count a ballot even if it is not inserted properly in the machine by keying on the corner cut. Because that cut was wrong, this fail-safe feature failed.

Only Republicans Affected

Only Republicans' ballots were affected because, as part of the test of the system, Republican ballots were inserted into the counters in different positions to test the corner cut fail-safe method, while Democratic ballots were all fed in the same way.

CES was notified by IBM on Feb. 20 that faulty cards had been sent out, but the CES regional office which handles Concord claimed it was not notified until after the primary, according to a local newspaper.

The salesman for CES did not notify the city of the faulty punch cards because he "assumed" none of those cards had been used, the newspaper said.

Gross is still satisfied with the performance of the system: "It had a high degree of public acceptance. The public found it easy to use and easy to learn how to use," he said.

Questionnaries were handed out at the polls concerning the CES system and, of the 450 returned, only 30 were unfavorable, Gross said.

In addition, Ward 5 finished counting its ballots two and one half hours earlier than any other ward in the city without bringing in any outside help, Gross said.

House Sets Hearings On Bell-Fostered Bill

(Continued from Page 1)

man, Rep. Lionel Van Deerling (D.-Calif.), and the Senate subcommittee is expected to be headed by Sen. Vance Hartke (D.-Ind.) since the present chairman, John Pastore (D.-R.I.), plans to retire at the end of this session. Hartke is one of the Senate sponsors of the legislation.

More than 80 bills have been Introduced in the House by about 115 representatives and about 10 Senators have introduced legislation in the Senate. All are versions of the original bill introduced by Rep. Teno Roncalio (D.-Wyo.) three months ago [CW, March 22].

Although many members of Congress have sponsored some form of the AT&T backed legislation, most have been hesitant on making public statements on the merits of the pending bills. Many have stated they introduced the legislation mainly because the issues involved should receive a hearing before Congress.

In order to expedite early hearings, several congressmen have introduced resolutions calling for consideration of the issues in the Consumer Communications Act. One such resolution, introduced by Rep. James Delaney (D.-N.Y.), called for hearings to be commenced as soon as possible by the House committee with appropriate jurisdiction "to consider and determine the future telecommunications policy of the nation.

"The question of whether [recent] FCC decisions will lead to increased competition. . . to the betterment of the consuming public or alternately result in higher telephone rates and poorer service for 67 million households is a matter of national policy and should be reviewed by Congress," the Delaney resolution said.

Bell Visits

Meanwhile, Bell System representatives have been working to reach each member of Congress with a personal visit. A recent article in the *New York Times* said chief executive officers from the 23 Bell operating companies had visited each member of Congress to spread AT&T views on the proposed legislation.

Each Bell operating company has formed an "industry committee" for the express purpose of visting members of Congress and discussing the legislation, a Bell spokeswoman said. The committees also include officials from independent phone companies.

Thus far the industry committees have visited all members of the Senate and "we are endeavoring to contact all members of the House," the Bell spokesman said. In many cases, the visits are being made by the president of the legislator's local Bell operating company, she added.

A random check of Senate staffs confirmed many had been visited by executives from local Bell operating companies. "There has been extreme pressure from the telephone companies to get some favorable action. Their lobbying effort is intensive," one Senate staff member said.

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Use of Encryption Algorithm Urged

Security Called Major Task for National EFT System

By Toni Wiseman
Of the CW Staff

NEW YORK – The emergence of a national electronic funds transfer (EFT) system is inevitable, so the task now facing the computer industry is to make that system a secure one, David Kaufman of Systems Development Corp. said here recently.

"Unless planning for security and for operation on a national scale begins now, development of an efficient and secure future system may be impossible," he told a session at the National Computer Conference.

Kaufman made several predictions concerning the operation of a national EFT system. First of all, he said, all funds transfer transactions will be initiated by a customer using a bank card.

Completion of the transaction will require three types of information to be entered into a remote service unit (RSU) or transaction terminal – a personal account number, financial institution indentification and possible other data such as credit rating and card expiration date.

The cardholder will then enter his personal identification number (PIN), and the clerk will enter transaction-type information.

The three operational requirements for a national system – reliability, expandability and security – are all possible with current technology, Kaufman said.

This means the system must provide continuous service, probably through the use of backup sites, if the host processing center (HPC) is down, he said.

Six security principles should be incorporated into any EFT system, Kaufman said.

First, the PIN should be known only by the cardholder since it is a potentially powerful tool for providing EFT security and the only current means for positive identification of the cardholder, he explained.

In addition, there should be no way to derive the PIN from information on the card.

Fourth, to ensure user privacy, there should be no unauthorized exposure of personal data, Kaufman said.

To ensure transaction integrity, transaction data should not be subject to unauthorized alteration, he stated.

Finally, all transaction requests and authorizations should require positive identification of authorized access at their destination.

Cryptographic Possibilities

Cryptographic techniques may provide an answer to many of the security problems facing EFT systems, Kaufman suggested.

In the simplest form of an EFT network, a transaction processor (TP) would link RSUs to the rest of the system, manage funds transfer requests initiated at RSUs and perform the one-way PIN transformations, he said. A switch would then interconnect HPCs and TPs.

For security, Kaufman proposed the use of network cryptographic devices (NCD) using the National Bureau of Standards' data encryption algorithm.

NCDs, he said, do not presently exist, but are technically viable. Assuming the existence of the devices, however, NCDs could maintain a fully interconnected network, interfacing TPs and HPCs to the switch.

"By using a unique key, each NCD can protect the communications path to any other NCD in the network," he said.

Thus NCDs would be used to authenticate the source of HPC and TP messages. Enciphering and deciphering of messages by NCDs would be based on secret values, or keys.

An NCD could not decipher a message unless it knew the key used to encipher the message, Kaufman noted.

He envisions each NCD maintaining a unique key for communicating with each of the other NCDs in the EFT system.

For example, if TP_1 attached to NCD_1 sends a message to HPC_2 attached to NCD_2, the key used by NCD_1 to encipher the message would be known only by NCD_1 and NCD_2.

When NCD_2 received the message, NCD_2 could thus be sure the message came from NCD_1. The source of the message which arrives at HPC_2 would therefore be TP_1, he explained.

Services Sector Seen Benefiting From EFT

NEW YORK – There is no commonly adopted viewpoint on electronic funds transfer (EFT) systems in the computer services sector, but there are many opportunities for this sector to take advantage on them, William Hutton, vice-president of corporate marketing for Automatic Data Processing, Inc., told a recent National Computer Conference audience here.

"We talk about EFT as being a brand new thing which is drawing on the horizon, but in reality it has been around for years," he said, noting the federal wire used to transfer funds between banks is essentially an EFT system.

"The new aspect of the technology is its intended proliferation," Hutton stated.

The first thing the services sector must do is determine what it really means by electronic funds transfer, he said. Check verification, for example, should not be considered a true element of an EFT system since it encourages the use of checks rather than discouraging paper handling, he noted.

There are four basic motivations for the implementation of EFT systems, Hutton stated. These include the elimination of reduction of float in banking systems; the reduction in operating costs, primarily in banking systems, which could be passed on to consumers; the prospect of customer benefits in terms of speed and services; and increased business opportunities for consulting software and hardware firms.

"Only the last segment is currently making any money on EFT systems," he stated.

DP has a ubiquitous terminal condition.

A special report on *Data Communications Terminals* in the July 26th *Computerworld*.

The dollar value of the U.S. installed base of both general and special-purpose terminals should increase to $25 billion by 1980, *$20 billion of which will be shipped in the next five years,* (based on estimates by International Data Corporation, the world's largest EDP market research firm). Clearly, more users than ever before are relying on terminals to provide solutions to complex problems, while increasing the utility and accessibility of their computer systems.

Computerworld will present a special report on Data Communications Terminals in the July 26th issue, including teleprinters, CRTs and intelligent terminals. Edited by Ron Frank, this supplement will cover a variety of topics of importance to data communications users, with application stories and tutorials throughout.

For example, we'll report on how new carriers and carrier services might affect the way terminals are used. We'll look at what applications require terminals with "intelligence" - i.e., processing logic and memory - and show you some of the best ways to make use of this hardware. We'll investigate what's being done to make the terminal environment easier to use. This includes items on recent teleprocessing software enhancements and new hardware features, to name a few. In addition, we'll report on where terminals are headed, and analyze what's been happening to the cost of terminals.

If you're involved with data processing, this is one subject you may want to be very familiar with. Don't miss it. It's in the July 26th *Computerworld*. If you're a terminal manufacturer, you should advertise here. Don't miss the July 9th ad closing. Call your *Computerworld* salesman for more details. Or call Judy Milford at (617) 965-5800.

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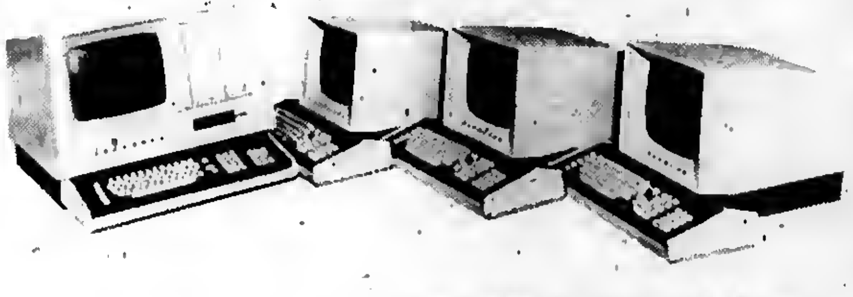

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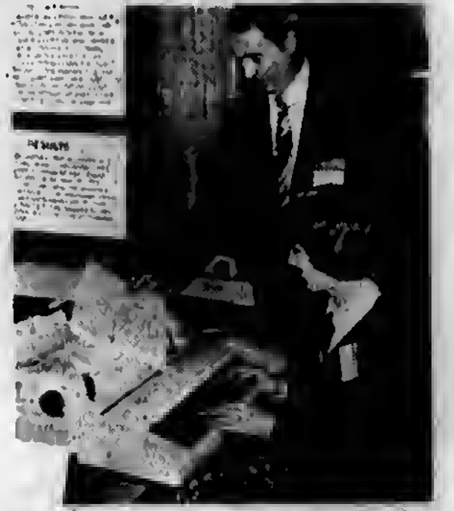
Ninth-Grader Snares Top Prize at NCC With Program to Model Spread of Fire



Walter Freitag Jr. demonstrates his prize-winning computer project to Gerald G. Probst, Univac president, at the recent NCC.

NEW YORK – The choice wesn't an easy one. Visitors to this year's Netional Computer Conference (NCC) Student Computer Fair, called Compyouter, said it was the best such exhibit by young people they had ever seen.

But, in the end, the best entry had to be selected, and that award went to Walter Freitag Jr. for his computer modeling of the spread of fire.

A ninth-grade student from Dresher, Pa., Freitag reasoned that while the spreed of fire in a structure is complex, it is also predictable according to the shape of the building and the thermal properties of the materials used in its construction.

He knew that if this information could be incorporated into a computer program, a prediction of the way fire moves through a structure could be made.

Programming in Basic on a Univac 1108 time-sharing system, Freitag developed a fire-spread model consisting of a series of eight superimposed three-dimensional matrices. For the purpose of his project, he limited the number of elements included and so minimized the size of the matrices.

Each building material in the program has four values associated with it. These include the total energy the material releases when burning; the temperature at which the materiel ignites; the heat capacity of the substance; end the material's combustion rate, or the number of time units it takes to "burn out," Freitag explained.

Each of these four pieces of information is stored on a separate matrix in the student's program. Another matrix contains a pictorial representation of the structure to be tested.

Series of Cycles

During e run of the program, Freitag first inputs the matrix coordinates where the "fire" is ignited. "Then, in a series of cycles, each cycle representing one time unit, the program uses the data stored on the matrices to predict the extent of the fire's propagation," he said.

"At regular intervals, the program then prints out the three-dimensional structure matrix showing the 'burning' and 'burned-out' areas of the structure," he added.

Freitag plans to edd more variables to his model and noted that if the program is to have prectical epplication, it must include elements like air flow and oxygen depletion.

Freitag envisions the ideas in his model being used to allow firefighters to recognize dengerous firetrap situations in existing buildings, to plan new buildings to be as safe as possible and to develop a plan for extinguishing a fire as quickly as possible once it has started.

Freitag began programming in fifth grade when his older sisters brought home a textbook dealing with DP and a science teacher invited him to try his hand at writing an averaging program.

With the exception of a nine-week elective offered by his junior high school, most of what Freitag knows was self-taught.

His prize was the Altair Mits 8080 minicomputer kit. Freitag said the first thing he plans to do with the 8080 is learn how to build and use it.

He isn't sure he'll be able to use it as much as he thinks it should be, so Freitag may lend it to his junior high school.

Afips Presents Harry Goode Award To L.G. Roberts, Telenet President

NEW YORK – The American Federation of Information Processing Societies (Afips) this year gave its Harry Goode Memorial Award to Dr. Lawrence G. Roberts, president and chief executive officer of Telenet Communications Corp.

Presented during a special session at the National Computer Conference here recently, Roberts received the award "in recognition of his contributions to the architectural design of computer-communication systems.".

Afips President Anthony Ralston cited Roberts' "leadership in creating a fertile research environment leading to advances in computer and satellite communications techniques."

Ralson also praised Roberts for his role in the establishment of standard international communication protocols and procedures.

Finally, Roberts received the award for his accomplishments in the development and demonstration of packet-switching technology and the networks which grew out of that work.

Established in 1964 to annually honor and encourage outstanding contributions to the information-processing field, the award is named for Harry Goode, a pioneer in computing and a major force behind the federation of associations, who died in an automobile accident before Afips was formally chartered.

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Editorials

Naive, Yes; Wrong, No

Anthony Ralston, the outgoing president of the American Federation of Information Processing Societies (Afips), admitted he might be naive in his recent call for professional societies to get involved in social issues [CW, June 7].

That plea was in many ways naive, but it clearly pointed to a new direction needed for the societies.

Too often, the practioners of this trade ignore the larger social consequences of their work and concentrate on the more limited technical question. The Universal Product Code was a good example of putting a technical development on the market without any consideration for the consumer.

Many other issues – monopolization in the industry, privacy and so forth – fit into this category.

But Ralston is naive in feeling technical input will help society at large sort out the problems. The issues raised have much less to do with technical questions than they do with questions of sociology and public policy.

Technicians should not limit themselves to a role in the debate solely as information providers, but should take public policy stands.

There will be disagreement on the proper application of technology among the technologists, but only a full debate of the deeper sociological questions involved in technology will be useful to the public policymakers.

Printer City

The recent National Computer Conference (NCC) reminded many of a printer warehouse. There are no official totals of such things, but attendees agreed it was easy to count 30 printers on the floor without any trouble – and there were probably more.

To DP managers concerned with providing an ever-increasing flow of printed CPU output to corporate users, the changes in printer technology bring help in several ways.

It is no secret that the printer – whether attached to a CPU or a terminal, is a vulnerable device. Any electromechanical unit which is almost constantly in motion is subject to stress and wear.

But the technology is changing and, as it does, the reliability is improving. Printers are relying less on servo motors and potentiometers and more on electronics, for example. And the electronics are being packaged on modular circuit boards which can be stocked and even replaced by the user if a maintenance man is not within a reasonable distance.

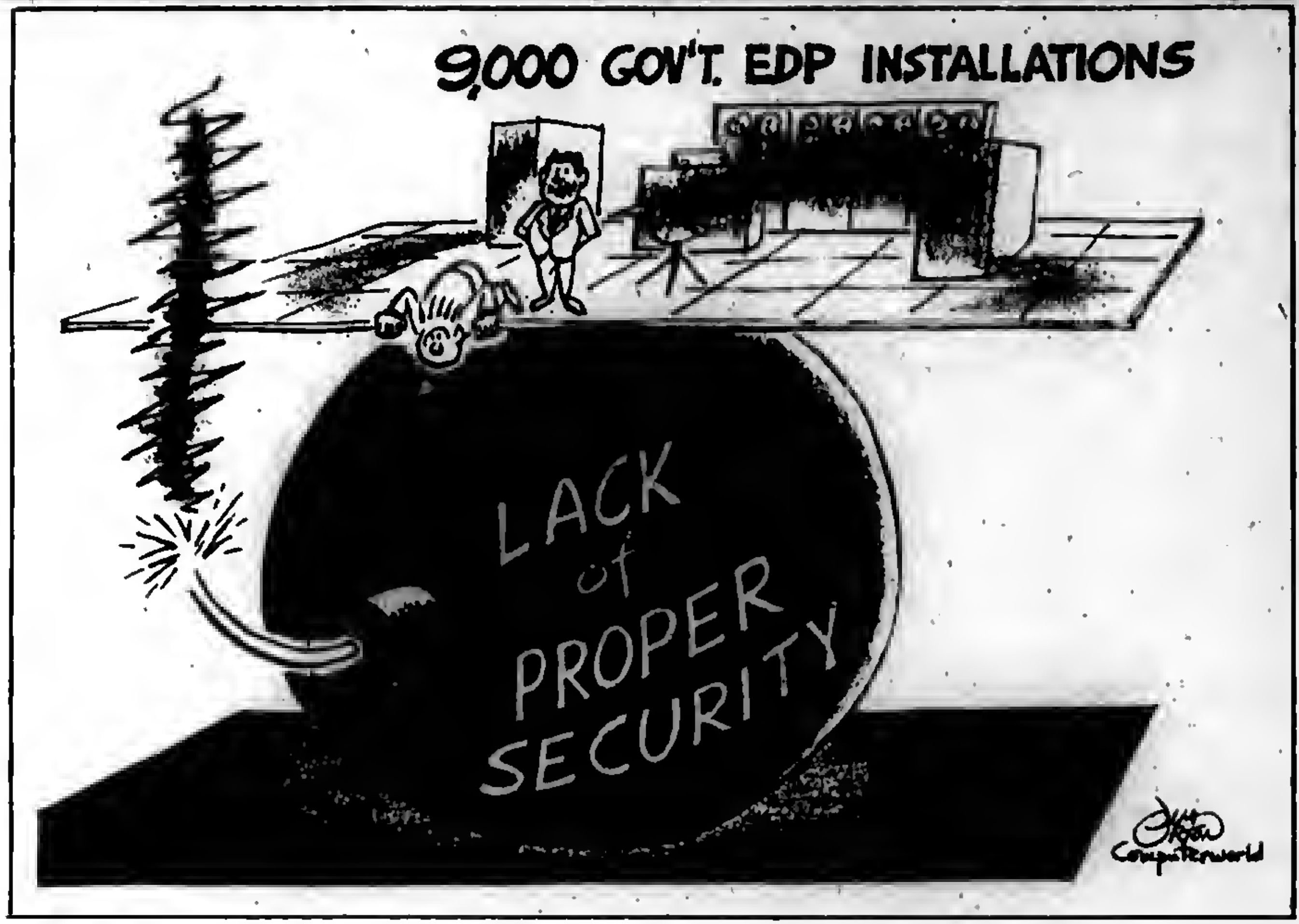
The print heads are changing too. The introduction by IBM of an ink jet printing unit for the System 32 is typical of the new methods being found to put a character onto paper.

Even for users who want to upgrade their systems, there is a benefit. The addition of a faster printer to a minicomputer-based system or a mainframe often can improve output at relatively low cost.

Almost every DP installation is faced with increased output printing loads as the number of users accessing a CPU goes up.

Improved printing devices may not have as much glamour as the latest CPU number crunchers or double-sided floppy disks, but they serve a vital need.

When reports to management are late because of printer malfunctions, the entire staff is blamed. The new breed of printers may help to keep that output flowing on time.



'We Just Ignore It, Hoping It'll Blow Away . . . '

Letters to the Editor

Grosch Picture of ACM Election Falsely Divides Membership

Although perhaps attributable to his natural exuberance at being elected president of the Association of Computing Machinery (ACM), Herb Grosch painted a picture of the ACM election which was false where it was not misleading and which, moreover, set an unfortunate tone for his administration by a crude attempt to divide the ACM membership into establishment and nonestablishment types [CW, May 31]. We two members of the three current ACM nominating committees think it is necessary to set the record straight.

We deny the existence now or in the past of an ACM establishment. The variety of people who have held office, particularly in recent years, is ample proof of this.

Our disagreements with Grosch on ACM policy and directions had nothing whatever to do with our failure to support his nomination for president. These disagreements with him are considerable, although, as Herb well knows, one of us, at least, is much closer in viewpoint to him on his human issues than to either of his opponents in the election.

In any case we saw our task to be one of nominating the most able, most deserving candidates quite aside from agreements or disagreements with us. One most important qualification, we believe, was previous service and willingness to work for ACM.

Herb correctly outlined the ACM positions he has held. But in none of these, most particularly as vice-president, has he been a hard-working, effective contributor. As he noted himself, he has "never been addicted."

That was the one and only reason we did not support his nomination for president; we didn't think he deserved it.

Far from being "afraid to risk" nominating Dan McCracken for vice-president, he is esteemed by us and was high on our list of potential candidates. He was not higher only because he is currently serving his first term on council and his previous service to ACM, while significant, falls far short of that of the two candidates we nominated.

Finally, Grosch accused one of us of backing one of his opponents in the election. That was flatly false. Not only did neither of us play any role whatever in electioneering, but the one of us who was approached urged others not to electioneer either.

George Glaser
Anthony Ralston

ACM
New York, N.Y.

For another view, see commentary on **Page 12.** Ed.

Data Past

Five Years Ago
June 23, 1971

WASHINGTON, D.C. – The problem of individuals' privacy was seen as serious and urgent by congressmen, labor and management leaders, students, law enforcement officials and academicians at a three-day series of sessions sponsored by the Transporation Institute and the AFL-CIO Maritime Trades Department.

– – –

BOSTON – Nearly half of Massachusetts' $2 billion budget was spent on public welfare and a team of unemployed computer technicians blamed poor management of DP resources for much of the cost runaway after conducting a four-week study of the state's Welfare Department's computer usage.

Eight Years Ago
June 19, 1968

WASHINGTON, D.C. – The first patent for a computer software program was issued by the U.S. Patent Office to Martin Goetz, vice-president of Applied Data Research. The issuance represented a landmark after the withdrawal earlier this year of the proposed "Section 106" designed to outlaw patenting of computer programs. Goetz filed the application on April 9, 1965 for a sorting system.

– – –

WHITE PLAINS, N.Y. – IBM offered Call/360 Basic, a new time-sharing service which was cheaper and more flexible than its Quiktran service and, in a parallel announcement, inaugurated Call/360 Datatext, an improved version of its subscriber text-editing service. The offerings were indications IBM was going after the time-sharing utility market in earnest.

Calif. Privacy Act Costs Higher

In the issue of May 17, I was correctly quoted as saying General Electric's (GE) costs to comply with my California Privacy Act would be $64,000. This number represents continuing annual costs and does not include the start-up or one-time costs to comply with the act.

I have recently been informed by GE that this number should be $76,000 and that this represenls the annual ongoing costs for all the GE components affected by the act.

Mike Cullen
Chairman, Joint Legislative Audit Committee

California Legislature
Sacramento, Calif.

Japan II

One of the pleasant things about my conversations at Fujitsu was the chance to recapture, in a fourth-generation environment, many of the earlier excitements of the American computer scene. That's not intended to imply a ten-year lag, or anything of the sort; in many areas such as bank networking, seat reservations on the terrific railroads, and digital services via pushbutton telephone, our Japanese con*freres* are ahead of us. But in other areas we are only beginning to find out about what they have already done, and done very well. Fujitsu systems people are only a year or two behind current American practice, and still working to close the gap. Applications vary according to field; because of my old personal involvement with space activities I was deeply interested in the NASDA (Japanese National Space Development Agency) situation. Research, electronic development, and specialized agencies of five government ministries are interlocked, with oversight by a Space Activities Commission. Satellite launchings, with help from our NASA in some cases (tracking, for instance) are done from the island of Tanegashima, off the southern tip of Kyushu. There are major tracking stations up near Tokyo (Katsuura) and on Okinawa, and two down-range toward Kwajalein. There is also a major Tokyo University space center on southern Kyushu.

Two satellites have been dispatched; three more, including meteorological and communications versions, are to go up in 1977. The tracking and control center (Tsukuba, near Tokyo) has Hewlett-Packard, duplex Fujitsu FACOM 230-38 and duplex 230-75 equipment; the meteorological data processing center has two multiprocessor 230-75 installations. Hence, Fujitsu's pride in the project! And needless to say, there was heavy software involvement: on-line stuff, tracking and command, image processing. New work includes integration of the systems at the above two centers, celestial mechanics and telemetry subsystems, and so on.

I was told this story, and about the banking net, in Tokyo and Kawasaki. I then got a fascinating tour through the LSI research operation – or, more likely, a small part of it. This included the first look I have personally had at experimental equipment for ultramicrolithography, and this was in advance of the Japanese national VLSI project support, which involves cooperation with Hitachi and Mitsubishi, and other support from the telephone company. I was not asked to sign a confidentiality promise, as is sometimes done in the U.S., but I was asked not to talk too freely about what I had seen. My guess is that with the exception of IBM and possibly TI, this Japanese venture is as advanced as anything here, and – if one includes the reduction to high-yield practice – ahead of anything in Europe.

My hosts then whisked me off to a resort hotel near Nagano, presumably to test my resistance to a Japanese breakfast. Reminded me of some curious morning repasts in Jerusalem, it did, only no herring! Well, like the WW II veteran asked what he did in the great conflict, I survived! Compared to the raw tuna, cuttlefish, sea urchins and ginger slices of a magnificent Tokyo *sushi* feast, it was minor stuff.

My major impression at the huge factory was of the fantastic investment in automated test procedures, most of which required special machines designed and built inside Fujitsu, and incorporating their own small computers and numerical control equipment. Another was of the diligence of the workers, male and female alike; a great asset to their society, as we all know, although somewhat reduced in the eyes of easy-hire-easy-fire California by the necessity for career-long security from the employer. As I said in a speech some years ago in Geneva, Japan is a very IBM-like country!

Due to the rapidity of systems test, and to the fact that LSI components contain much more of the complexity of the total machine than 360 modules or second-generation boards (and are completed tested elsewhere), the 230-series machines march down the automated line and out the door at a fine rate. A great deal of attention is paid to failure analysis, both by examination of voluminous computer outputs from the test gear and from the system being tested, and by physical checking of hardware before it is recycled.

After a great steak luncheon at the luxurious Sacramento (!!) restaurant, I had a shorter tour of a sister plant which makes components, including those for ultra-long-life submarine cable repeaters. Then there was a remarkable train ride, over three hours, through the mountains of central Honshu, north to Nagoya.

The user conference was held at the Nagoya Castle Hotel, more modern even than the Imperial in Tokyo where I stayed this trip. A little less English spoken, perhaps, than on the Tokyo/tourist circuit, but beautiful European cuisine. I tried a Japanese white wine, but would next time join my companion in a Pouilly-Fuisse! Anyhow, I was tucked in for the night, with floodlit Nagoya Castle framed in my picture window.

I gave the keynote next morning, on industry futures and new technologies. Speakers get to wear white silk chrysanthemums, with red ribbons saying (I presume) "honored guest." Much prettier than our dull badges. And I used up forty business cards that day alone! As I said in the previous column, I had 800 registrants and perhaps 50 Fujitsu people in my audience; simultaneous translation – for that session only, so I could not hear the technical papers. But, as the seminar I did the year before with other *Computerworld* people, there were good questions from the floor; this is still not too common in Japan, and is one thing American speakers are encouraging. And, as I also said before, there are now women in the audience.

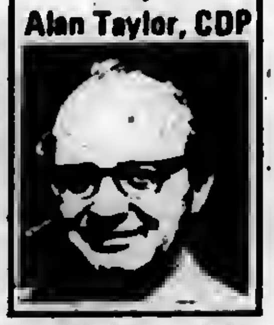
Herb Grosch

Feedback to Management Marks Second Generation

The Taylor Report

By

Alan Taylor, CDP



The Supreme Court has spoken, and the systems analysts of the airline industry now know that it is – and always was – wrong to issue more confirmed bookings than there are seats on a plane, even when a government agency is prepared to look the other way. And now the search is on for replacement algorithms to supplant the old percentage overbooking ideas.

In many ways the airline analysts are lucky. They don't have to convince their boards of directors and presidents that something has to be done. The court has done that for them.

The analysts don't even have to convince anyone that whatever solution they now put forward will have some problems. The long-standing defense of the current overbooking standards has included objections to pretty well every possible alternative, so these are still fresh in most persons' minds.

But the systems analysts do have to do some work themselves. They have to think about just what role of a systems analyst is and just what system selection is now going to be. And no one is really laying this out for them. So here goes.

Looking back, we can now see that in the first-generation systems the role of analysts was to:

- Take some particular solution.
- Compare the amount of work it needed with the amount of work other possible solutions needed.
- Select the one with the least amount of computation.
- Tell management the "correct" solution had been found.

In this matter, it was assumed there was a simple, correct solution.

And that was the hallmark of first-generation systems. In fact, many of the suggested solutions were the best immediately available ones, but they were not complete solutions, just approximations.

Second-Generation Systems

In second-generation systems this point, that the simple solution is just an approximation, is recognized. The analyst's question now becomes how to handle "failures" that result from the use of the approximation. Obviously, systems analysis being something that deals in quantitative as well as qualitative matters, this is an area where the analysts can perform some good work. The analyst will document, as a part of the operation, the results of the approximation under study.

From management's point of view, this part of the analysis will not be happy reading.

All sorts of things will be discussed here which have been quietly kept under the rug during the era of first-generation systems.

The airlines now know what the results can be in their own case. They can lose a nationally publicized lawsuit and have their overbooking practices brought to the attention of the buying public. Taken to extremes, it could look as though every overbooked, bumped passenger would now sue and that the suits would be as expensive to defend and lose as the Nader one has been.

This analysis of results is unrealistic, however. In fact the cost of continuing to overbook would be imparted by management decisions as to legal strategy, whether to admit liability, etc. There is no way in which a systems analyst can forecast such necessary management decisions, which brings us to the second point of second-generation systems.

No 'Correct' Alternatives

In second-generation systems, the systems analyst no longer decides the "correct" alternative. Knowing there is no correct alternative, he places the decision before management. True, in case of need, he may say that until he is overruled such and such a decision will be assumed.

Even here, however, he admits management not only has a right to overrule his opinion, but, because it knows better than he can how management decisions will affect problems that will inevitably arise, management actually does know best.

The second-generation systems analyst, knowing what system is to be used and knowing the problems involved, has now to face the question of how to organize a solution that will minimize the problems.

In the first generation of computerized systems this was an ignored part of the operation. The solution, once programmed, was effectively set into concrete, which gave rise to the well-known "computer arrogance" syndrome.

The appearance of arrogance is still with us in too many cases simply because the system was not designed to be flexible.

Minimizing effects is possible only when one knows what effects are occurring. The key to the new systems approach must therefore be to provide such knowledge.

Now we come to a staffing problem. Under first-generation systems philosophy, the system was designed and implemented. Then the analysts went away.

Problems were allowed to develop over the years without the attention of more than a maintenance programmer who wasn't a systems analyst. Sometimes, of course, the programmer did change the system to meet one systems problem, but not being trained in the nuances of the matter, might – and did – wreck other parts of the systems while being successful on the surface.

This inadequate staffing just won't be possible for second-generation systems. The trained understanding of the system must continue throughout the operation of the application somehow or other.

Some form of feedback regarding the incidence of the problems that do occur and the effectiveness of minimizing methods in use will be needed. "No problems reported" will be a familiar report. But in second-generation systems that report in itself, given in full knowledge of what the potential problems are, is the mark of a good system collaboration between analyst, management and operations.

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The ACM Presidential Election: Another View

By Jean E. Sammet

Special to Computerworld

It is with considerable regret that I feel I must end my term as president of the Association for Computing Machinery (ACM) by responding to Herb Grosch's May 31 column and, indirectly, to some of his other columns.

I have not responded in the past because I decided silence was in the best interests of ACM. However, I now feel it is essential to set the public record straight.

It is regrettable the incoming ACM president has chosen to repeat many of his false or meaningless charges in a public newspaper. Furthermore, he has a remarkable knack for masquerading virtues as vices and vices as virtues.

For example, he appears to criticize me for working hard and simultaneously says *he* doesn't believe in working hard. (You may decide for yourselves wherein lies the virtue or the vice.) Similarly, he constantly refers to some nonexistent and undefined "Establishment" in a pejorative manner but fails to mention any of the reasons for the opposition to him from many people who have worked closely with him.

Let me state my views and some facts:

1. I consider it the duty and the responsibility of any nominating committee to select the best qualified people available. Since the incumbent vice-president has an obvious advantage, it seems clear the nominating committee decided Grosch did not meet that criteria.

The reasons it had in selecting the nominees for vice-president can best be addressed by the nominating committee, but I can guess the nominees were simply people with greater experience in, and service to, ACM than other potential candidates.

To point out that people supported nominations by petition does not mean much. I believe anybody of any prominence (which is not necessarily the same as experience or capability) can easily obtain the less than 250 signatures needed to run for ACM office.

2. Grosch proclaims his great activity in ACM. However, I regret to say I am unaware of anything constructive or significant he has done in any of the committees or positions in which he has served.

I feel his forte – and it is a useful one on occasion – is as a negativist, that is to oppose things other people propose. But from my experience I am unaware of any significant action ever initiated and carried through by Herb Grosch before or during his service as vice-president.

Reader Commentary

Even in areas and on policy issues where he and I were in significant agreement, and where some work on his part would have been useful as far as I am concerned, he did not volunteer (and/or decline) to do anything.

3. Grosch seemed to imply in his column that one of the reasons he ran for ACM president was for spite. He stated he "would probably have refused nomination" as president if he had been offered a chance to run as member-at-large; he certainly could have obtained petitions for that position!

The reader should form his own opinion on the quality of a person who runs for office if one of the reasons for doing so is apparently in order to thwart others.

4. Grosch continues to refer to "the Establishment" as some vague but bad group. However, as a Council member since 1968 and as a vice-president since 1974, Grosch has to be classified as a member of the Establishment *using the most common meaning of that term.*

Although Grosch never defines "Establishment," I think he really means anybody who disagrees with him!

5. Grosch implied Tony Ralston was involved in the effort of sending letters to various individuals supporting Carl Hammer. Tony had nothing to do with this effort and, in fact, he advised against it.

6. I remained silent when Grosch used his April 12 column to write a long diatribe against me (albeit without naming me) and to misrepresent my views; I regard this as the use of his column to espouse his own viewpoint on the matter of ACM as an educational and scientific society while he was a candidate in the ACM election.

I feel he implied this was a significant campaign issue. However, as I read his platform statement he devoted approximately 35 words (out of a total of about 500) to this issue, whereas he used almost 70 words in his platform statement to criticize Tony Ralston and me (and misrepresented my views and actions while doing so).

I think it is unfair for him to claim this was a major campaign issue when *he* devoted so little space to it!

My March "President's Letter" in the *Communications of the ACM* was a clear-cut statement of *my own view* on why ACM should remain an educational and scientific society. As far as I am concerned, this was *not* a significant campaign issue; a number of the people who opposed Grosch agree with him on this point and didn't like my March "President's Letter" either!

It was a coincidence it appeared at that time, but it had to appear in the March issue because I wanted to state my position on this matter before my term ended and the letters for April, May and June were committed to other topics where specific timing was required.

7. I do not agree with Grosch when he implies he had not used his column for "personal ACM advantage" prior to the column [CW, April 12] that he seems to admit was used in that context. He has certainly used it for ACM matters, although I do acknowledge he has quite properly *not* made use of internal ACM correspondence.

However, he *has* used it to espouse viewpoints on ACM matters, knowing full well he might be a candidate in an election and thus might have an advantage relative to other candidates.

In one column he castigated the ACM Council for actions he didn't like. In another and more serious pair of columns, he castigated the IEEE Computer Society and criticized a number of individuals for actions they took which he felt were deleterious to ACM.

I found his comments about the others so insulting I twice felt obliged to send letters to the individuals involved indicating that his was not an official ACM position.

8. I do not understand what the "dour grip of the Establishment" is. Many of us have worked very hard for ACM and have disagreed on many issues. I have found no evidence that Grosch has done any significant work for ACM in the past, and to me his column implies he's not likely to do very much in the future.

Nevertheless, I accept the decision of the ACM membership and I am quite prepared to cooperate with President Grosch if he wants such cooperation.

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Process With 11 Steps Suggested

Total Study Urged for Users Considering Packages

By Don Leavitt
Of the CW Staff

NEW YORK – The decision to adopt or avoid packaged software is more critical than is generally recognized; no matter how the decision goes, it will have ripple effects on the productivity in both end-user and DP areas within an organization, a session on "Productivity Payback" was told at the recent National Computer Conference here.

An economic analysis in conjunction with a feasibility study should ensure any proposed software purchase will have little if any negative effect, Thomas F. Meurer of Cullinane Corp. said.

On the other hand, he added, the usefulness of such an approach is largely dependent on the "active leadership and ongoing involvement" of user department managers.

Outlining an 11-step process, Meurer said it should provide answers on both the technical and economic feasibility of any acquisition or in-house development. But the results of each step must be the product of both functional (end-user) management and the DP staff, he emphasized.

Before going into the details of his plan – "and it's an expensive one," he admitted, "I don't know anyone who has implemented it completely" – he warned "quantitative techniques must be placed in perspective. . .analysis should be structured in a way which emphasizes the qualitative thinking and logical reasoning used to examine the key aspects of a proposal."

After identifying the problems "or opportunities" – "and that has to be an iterative process since later work may invalidate first assumptions" – the analyst has to describe the relevant environment, Meurer said.

This analyst has to describe the relevant environment, Meurer said.

This applies whether the proposed acquisition is a system/utility that affects the DP department or an application package, he added.

Objectives for Quantification

The next step is to postulate and quantify objectives. This will indicate how far the proposed system goes in meeting the identified needs, the speaker went on.

Without objectives, he noted, the payback gained from any decision "can't possibly be quantified.

"Since quantification is desired at this point, the objectives must be expressed in measurable terms," he reminded his listeners.

The final step in the preparatory part of Meurer's plan is to identify the assumptions and constraints that underly the objectives. Assumptions focus on the key factors, processes and variables affecting the analysis; constraints are factors external to the revelevant environment which also limit alternatives to problem solutions, he explained.

This step must be realistic, he warned, noting that any alternatives developed later can be considered feasible only if they satisfy all the restrictions assumed by the analyst.

If real restrictions are unrecognized, alternatives that seem to fit "just won't," while all possible alternatives may be washed out before the final decision if too many demands are imposed.

Stick With Baseline

Presumably the analyst is now in a position to develop alternatives, and a continuation of the current operation – as portrayed in the earlier environment description – probably should be considered. It is the baseline to which all other alternatives will be compared, Meurer explained.

The other choices "obviously" are in-house development of a new system, acquisition of one from "outside" or some sort of combination, he said.

However extensive the list, the next step is to determine costs involved with each choice, followed by cataloging the benefits each approach might bring to the installation or the end users within the

(Continued on Page 16)

Hardware Vendors Bring Most Software to NCC

By a CW Staff Writer

NEW YORK – Hardware vendors had more new software to talk about at this year's National Computer Conference (NCC) than all the software and service vendors.

But perhaps that's not surprising; after all, there were very few software vendors at the recent show, and it's hard to demonstrate software without some kind of equipment.

Four-Phase Systems, Inc. demonstrated its Starter package, designed to help novice users set up CRT screens and work their data entry systems. At the same time, Datapoint Corp. announced its DS3Net extension of Datashare, enabling users to access both local and remote data bases.

Hewlett-Packard Co. (HP) described its latest version of the Image data base management system. Image 1000 is meant for 21MX series minis and RTE-II and RTE-III operating systems, much as Image/3000 is meant for HP's 3000 equipment.

Control Data Corp. included its Cybernet remote-computing network as part of its display and vendor technicians were using Unistruc, a preprocessor for structural engineers, as the demonstration vehicle.

Now being test-marketed on the West Coast, Unistruc is expected to be generally available on the network in the fourth quarter.

Meanwhile, Systems Dimensions Ltd. described its recently implemented Project 2, a project management and control program that can be used for DP or more conventional projects.

Installation of Comten "smart" multiplexers has extended the Canadian-based network's capabilities to more locations on a local phone-call basis, a spokesman noted.

English Vendors

The largest collection of software new to the U.S. seemed to be available from the various English vendors at the show. Genesys Ltd., for example, had an integrated general engineering library including a Fortran-like language called Gentran and 20 operational application subsystems.

The software can be run on a range of U.S.-made minis and mainframes as well as International Computers Ltd. (ICL) equipment, he added.

Northern Software Consultants Ltd. showed details of its integrated series of accounting packages and noted it now has a U.S. agent – Software Design Associates here in New York.

Routines on Net

The Falcon Computer Bureau Ltd. had its professional service time-accounting routines implemented on the General Electric network and available for any user who felt capable of utilizing it on his own. A U.S. agent is being sought to provide support, a spokesman said.

On a more specialized note, Batelle Columbus Laboratories representatives said its Basis software had been adapted to Digital Equipment Corp. Decsystem-10, IBM 360/370 and Xerox Corp. Sigma 9 operation to support on-line retrieval of data base material.

People-Oriented Vendors at Show Outnumber Software Exhibitors

NEW YORK – Vendors with training and other people-oriented products were more in evidence at the recent National Computer Conference (NCC) than software and remote computing vendors, but even the educational exhibits were nearly overwhelmed by all the hardware being show at the Coliseum.

Advanced Systems, Inc. (ASI) of Elk Grove Village, Ill., used its booth to demonstrate its latest multimedia courses – video cassettes and student workbooks – designed to sharpen trainces' understanding of the IBM 360/370 environment and current concepts of program design and development.

Deltak, Inc. was also on the floor, featuring its multimedia courses on structured design, IBM's Information Management System (IMS) and the Time Sharing Option (TSO) of OS and OS/VS.

A 12-course program on "Practical Management by Objective" has been produced and is scheduled for shipment next month, a spokesman for the Schiller Park, Ill., firm said.

Touching on basically the same area, the catalog of books available from Science Research Associates of Chicago included *Management: Concepts and Situations* by Howard M. Carlisle; a new edition of the *Supervisor's Survival Kit*, "a mid-management primer by Elwood N. Chapman: and *Systems Analysis* by Philip C. Semprevivo.

Each of these has an instructor's guide to aid in adapting it to a classroom situation, the publisher noted.

There were in fact many publishers of a variety of books and periodical at the show. Trade magazines and newspapers were much in evidence, but so were both Auerbach Publishers, Inc. and Datapro Research Corp. with their various reference guides.

Boeing Computer Services, Inc. of Dover, N.J., best known in its role as a remote-computing network vendor, talked about Scope, an evaluation test approach for IBM 360/370-oriented programmers and operators.

At the same time, at least two rather local firms – Software Education Corp. of New York and Chubb Institute of Short Hills, N.J. – also had booths at the show and described their capabilities in support of training classes either at a central location or at a customer's site.

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Self-Assessment Form Offered

Unionism Seen as Growing Challenge for DP Manager

By Jack L. Stone
And Alexander P. Grant
Special to Computerworld.

Unionism among DP personnel is growing. All categories of DP employees are becoming involved, including professional, technical and administrative personnel.

Although we estimate the number of computer centers currently unionized is still small, many indicators suggest the trend is rapidly increasing. Specifically, interest in unionism is intensifying and broadening among DP programmer/analysts.

DP managers and supervisors who wish to assess their effectiveness in managing DP personnel can obtain the questionnaire for no charge by writing Stone at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

In examining the reasons why programmer/analysts are considering unions and the potential impact their unionism may have on the DP department, it is our objective simply to make management aware of this new challenge. It is not our intent to take a position either for or against unions.

However, as consultants in management development and training for DP organizations, we are concerned with the capability of most DP managers to deal effectively with unionized professionals. As one means of evaluating this capability, we have developed a questionnaire for management self-assessment. We will be please to send a free copy of this evaluation instrument to interested DP managers and supervisors.

Expectations Being Met?

Let's review some basic ideas of what DP professionals expect to receive from management in terms of their career aspirations and how well these expectations are being met. We define professionals as salaried scientific/technical employees exempt from requirements for overtime pay.

Dennis Chamot, in the May-June 1976 issue of *Harvard Business Review*, said that the professional employee and the employer are in basic conflict regarding the only practical means of resolving these issues.

"Unlike a production worker or a secretary, the professional expects to help determine the problems he will work on and the approaches toward their solution. All too often, his expectations fall short of reality.

"Dissatisfaction may result from inadequate technical support, insufficient opportunity to pursue interesting ideas, excessive interference by superiors, lack of sufficient input to project assignment decisions and so on," Chamot wrote.

This statement well characterizes the view of many of our programmer/analyst friends and students. In many DP departments, crucial decisions regarding their fundamental capabilities to operate effectively and efficiently are being made by managers who often do not have the necessary DP expertise and knowledge.

Upon these managers' authority, new applications are forced into the already overcrowded development program, with the usual requirements to meet impossible deadlines with no increase in manpower.

The outcome is predictable: poor design, project delays, inefficient systems and inadequate support. Many programmer/analysts feel coerced into taking such assignments, since the alternative could be loss of job.

Resentment of Management

Management often is not sensitive enough to the effects this situation has on the individual, particularly when these conditions persist over long periods of time. The programmer/analyst perceives his role to be absolutely essential to the DP operation.

He usually believes that a great job has been consistently performed in spite of management inadequecies and that management has taken advantage of the professional staff by virtue of its authority.

Many programmer/analysts feel, but do not necessarily openly say, management is making uninformed and arbitrary decisions which are denying them fundamental job rights, including:

- The opportunity to execute their assigned tasks at a high level of excellence.
- Participation in systems development planning to ensure adequate time, manpower and machine resources are provided.
- Participation in systems performance evaluations to ensure judgments are based on quantitative data and are fair and impartial.

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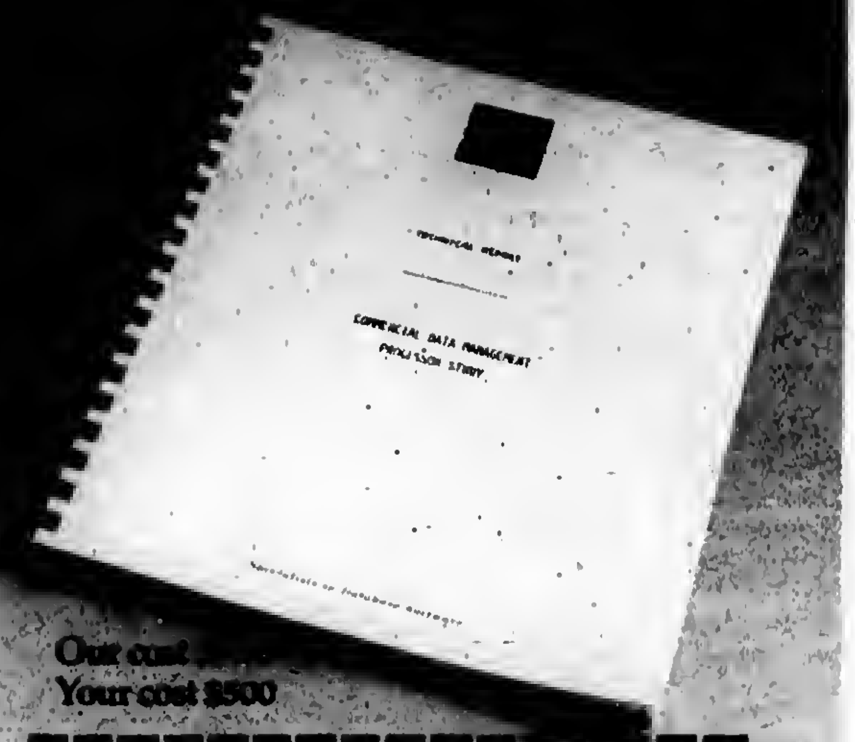
- Realistic and effective procedures for handling staff complaints and suggestions about the job and the organization.
- The opportunity to participate with management in the development and implementation of meaningful career planning.
- The opportunity to exercise a reasonable degree of control over personal career destiny.
- Controls over and/or additional compensation for continuing and excessive overtime work.

Movement Not Widespread

The logical question arises: If DP professionals have been thinking about unionizing, then why hasn't the movement become more widespread? Dennis Chamot addressed this issue in the previously cited article when he wrote:

"A major reason is that unorganized professionals frequently have limited knowledge of what unions are and what they can do. They tend to think of unions in terms of not too accurate blue-collar stereotypes . . . They are unaware of the flexibility of collective bargaining

(Continued on Page 16)



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Studies Economic, Technical Feasibility

Process With 11 Steps Urged for Package Evaluation

(Continued from Page 13)

organization.

That sets the stage for the comparison of the proposed alternatives, Meurer said. The basic approach should be to order them from the least to the most costly and to show the extent to which extra benefits are associated with each added increment in cost.

Baseline a Must

The baseline – current – operation must be included in this array, Meurer noted, so the decision maker has good perspective on the problem. But another part of that perspective is provided by the next step in the process.

In that step, the analyst tests the alternatives for sensitivity to change in any of the assumptions or constraints previously defined.

This may be the most critical part of the whole study, Meurer stated, since it recognizes everything up to this point may be built on false premises and proposed solutions may not hold up in the real world after all.

Presentation of the analysis to the decision maker should entail preparation of a synopsis or abstract which highlights the data considered essential to an understanding of the study.

Visual Aids

Graphs, tables or curves might be particularly appropriate in this step of the presentation, Meurer said.

The final step – "but one that many installations skip over" – is an updating of the analysis as new information comes to light, especially if the discovery occurs before the final decision is made and the new information is critical.

"It's far better to keep on top of a situation than to wish later you'd followed a rumor which later put one of your proposed alternatives in a totally different light," he concluded.

Managers Facing Rising Unionism

(Continued from Page 15)

and the legal safeguards that exist for protecting their right to influence internal union policies. In short, they need realistic models for professional unions."

Among the possible advantages of professional unions in the DP department is the fact that unionism inherently requires management to reshape attitudes and direct substantial resouces to problems of employee relations.

In addition, personnel management policies and programs, if erratically or arbitrarily handled in the past, quickly become orderly, planned and controlled.

Further, professional personnel gain confidence in dealing with management on issues. Feelings of professional stature are, in some measure, restored. This newly gained confidence should result in increased levels of productivity, but we have no proof that this is the case.

Possible Disadvantages

The potential disadvantages of professional unions include the possibility that unions may seek to negotiate a much broader range of issues regarding personnel relations than management would prefer.

As management is required by law to bargain in good faith, it is obvious management stands to lose some of its historic power and control over the DP professional staff.

Another possible disadvantage is that day-by-day management flexibility to assign tasks, hours and workload, which employees often call "exploitation" and management often calls "necessity," may be greatly reduced.

In addition, salary and fringe benefit schedules are fixed, uniform and competitive; unscheduled bonuses, cash awards and special benefits are often prohibited.

Further, tightly controlled grievance procedures will be installed, probably necessitating a major overhaul in personnel policies and practices.

Stone is the managing editor and Grant a senior associate of Computer Education International, Inc. of Washington, D.C.

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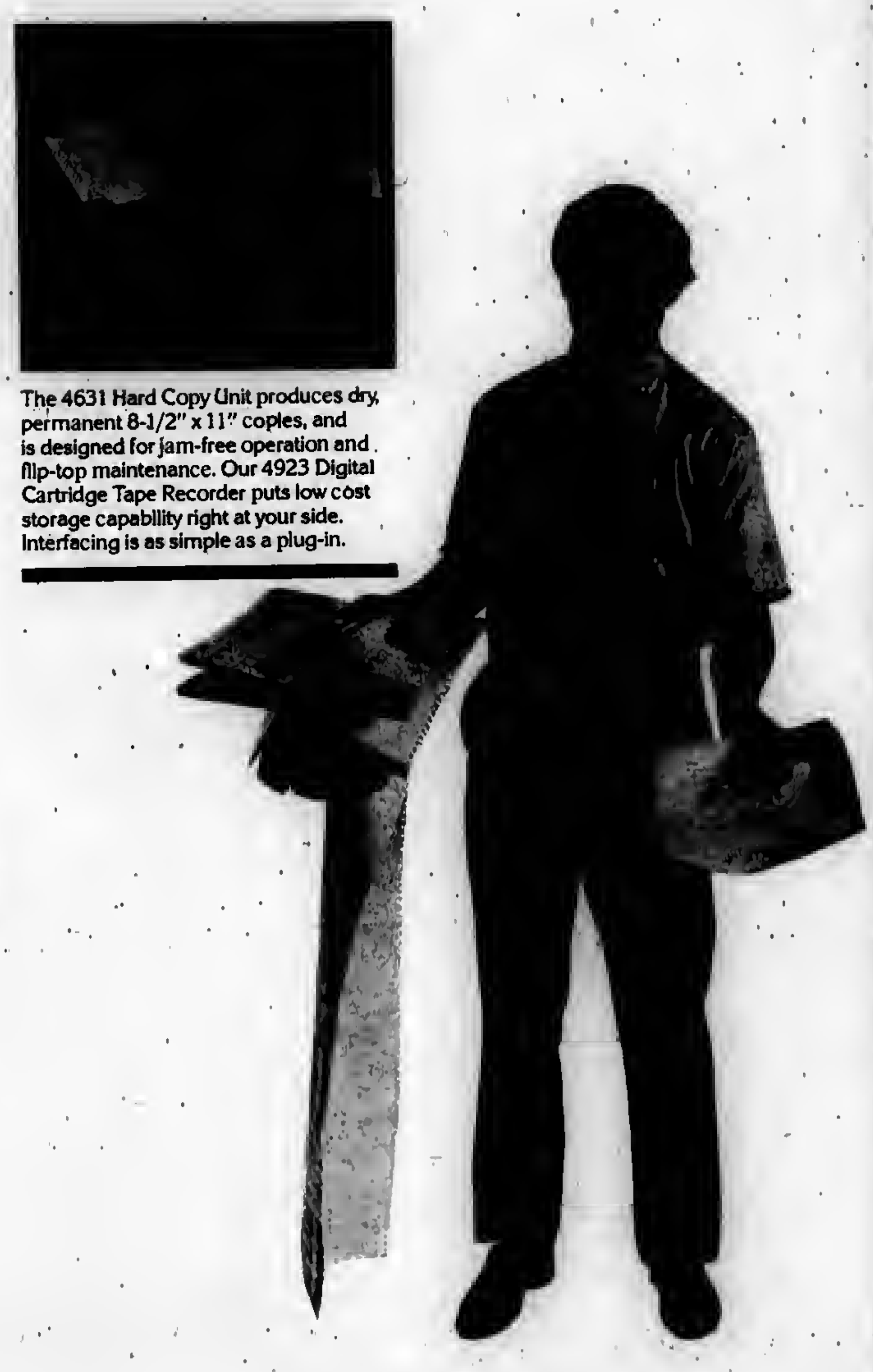

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Critical Need for Greater Software Productivity Cited

By Molly Upton
Of the CW Staff

NEW YORK – There is an urgent need for improvement in software productivity, panelists agreed at a session on "Software Engineering – What to Expect in the Next Decade" at the recent National Computer Conference here.

But they clashed on the rate of progress currently occurring and the means by which software engineers can be more productive.

Jack Goldberg of Stanford Research Institute presented a case for the integration of software and hardware engineering.

"The programming community has struggled hard to gain control of software, but has been ignoring the hardware world," he said.

Software people should "look over their shoulders" at the progress being made in hardware. New developments in low-cost componentry, such as microprocessors, are leading designers to use these instead of software, he said.

Harlan Mills of IBM in Gaithersburg, Md., said little will happen in software engineering in the next decade, but explained he didn't mean to be pessimistic as much as he meant to emphasize how short a decade is.

A significant event, he said, will be the rediscovery of classical tools that have been written off by today's systems engineers, such as formal grammar and recursive functions.

In addition, there should be an educational awakening because the universities have just barely realized what the good things are to teach, he said.

Robert Balzer of the University of Southern Calfornia at Marina del Rey said he's an optimist and thinks quite a bit will happen in 10 years.

"Structured programming is the greatest thing so far. Unfortunately, it doesn't solve programming problems, but it is the basis for vast strides forward," he said.

Balzer feels machines should be used to automate more of the programming. Causes of current software problems include lack of technology for specification, implementation, modification and optimization of programs, he said.

Optimization at many levels obscures clarity, Balzer said, proposing instead that a better way of programming is to design specifications to a formal abstract program, test that and then optimize it. He called this process "transformational implementation."

Eventually, he said, there could be a machine catalog from which the systems engineer could select a program whose validity is assured so the programmer need only be concerned with implementing and optimizing the program.

'Seven-Year' Rule

Tom Steele Jr. of Equitable Life classified himself as a pessimist, citing his "seven-year rule": "It seems to take seven years from the gleam in the eye of a laboratory technician to a first commercially available system."

The items in the lab today will be the mainstay of 1995, he added.

But what is alarming, he said, are statistics from the book *Data Processing in 1980-1985*, published by Wiley Interscience, which indicate that, by the 1980s, 70% of the work force will be dependent on DP to do their jobs and that more than 25% will have to have some knowledge of how computers work.

The demand for DP will vastly exceed the supply if software development is similar to the current state, he said.

Also within the 1980-85 timeframe, the cost of a system will be 90% to 95% the software cost, he said.

As an indication of the slow rate of progress in software, every decade raw hardware performance grows at a factor of 100, while cost/performance increases by a factor of 50.

However, the best crude estimate of increases in software productivity is 3% per year, he said, so in 10 years there will be a 36% improvement.

Extrapolating, he said 7.5 million programmers will be needed by 1985 if software continues at the current rate of improvement; four million will be needed if it improves at a 10% rate.

"We need real breakthroughs," he said, comparing the progress in software engineering described by other panelists as a "pimple on an elephant."

Runtime Problem

Maurice Wilkes of England's University of Cambridge said programmers must look beyond structured programming. The real problem is they have no idea of the runtime their programs need, he claimed.

It is tempting to use primitives in a "highly elegant and satisfying way" with disregard for the consequences in runtime, he said.

Patricia Goldberg of IBM's research center in Yorktown Heights, N.Y., said she sees improvement of compiler generation by 1980.

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Error-Detection Approaches Suggested

'Corrupt' Data Called Major Culprit of Data Bases

By Catherine Arnst
Of the CW Staff

NEW YORK – Incorrect data is one of the "serious impediments to the effective use of computerized data bases. Any decision-making system is only as good as the data which it uses; this is especially true of computer-based information systems."

This "truism" was elaborated on by Michael Hammer of the MIT Laboratory for Computer Science at the recent National Computer Conference here.

The major error problem with a data base lies with data that "is already corrupted" before it is input.

Naming several types of errors that can occur in a data base, Hammer said there can be the wrong data type (such as a word rather than a number), an inconsistency between fields of one record and fields of related records, some pattern out of order in the data base as a whole and missing data.

"Bad data can cause the malfunction of application programs that use the data base and can even degrade the performance of the data management software itself.

"On a more systematic level, erroneous data can destroy the confidence of an organization's personnel in the entire information system," he said.

Significance Unequal

However, not all data errors are of equal significance in the context of a particular information system. "It would be appropriate then, for a data-checking system to expend its resources in proportion to the importance and severity of the errors it is trying to detect," Hammer said.

The state of the art in error detection in relatively undeveloped, relying on "the simplest validity checks," Hammer claimed.

In addition, current data-checking systems are often very expensive to build and cumbersome, "relying on primitive brute force techniques to do the data checking," he said.

Conventional error-correction systems also do not provide a systematic capacity for response to an error situation, he said.

"Once the error has been detected, it is necessary to localize it and specify which data value is at fault. In many cases, the state of the art is incapable of doing this satisfactorily," he added.

Hammer proposed four general approaches that should be adopted when designing error-detection systems.

First, errors should be expected. "Do not design the kernel of the information system under the hypothesis that all data is correct and then delegate to an error-checking subsystem the responsibility of bringing about that state of affairs," he warned.

The goal of perfectly correct data is unattainable; the best that can be done is to minimize the presence of certain errors, he said.

Rules First

The second approach is to formulate the rules of the application first and then relate them to the constructs of the data base.

"Identify potential logical errors in terms of the data base transactions," he said.

Third, the importance of the various error types should be evaluated with respect to the decision process, considering both the sensitivity of the data and the impact of the error, he said. The resources of the data checking system should be allocated in line with this evaluation.

Finally, "anticipate the kinds of errors that may occur, identifying their sources, estimating their relative frequencies and determining the costs of detecting them."

The DP center should be prepared, he added, to adapt to changes in any of these factors: the definition of what constitutes an error, the patterns of actual error occurrence, the relative importance of errors and the costs of error detection.

"Learn from historical situations and detect emerging patterns as well," he said.

Cincom 'Total' DBMS Gets Data Dictionary

CINCINNATI – The Cincom Data Dictionary, recently introduced by Cincom Systems, Inc., provides documentation that shows IBM 360/370-oriented users of the Total data base management system (DBMS) what data they have in their systems, the vendor said.

While the first release of the dictionary was designed to interface specifically with Total, the second release – "probably in a few months" – will be a stand-alone version, Cincom said.

In that event, it presumably will be useful in any DBMS situation, the company acknowledged.

It will also interface, through a common file, with Socrates, Cincom's generalized extract and reporting system, the vendor noted.

Listings produced by the dictionary package typically are used by people involved in an organization's DBMS operation. The end user can be shown what data is already available at a level specific to his particular application interest.

At the other end of the spectrum, the data base administrator can have an overall picture of data, its structure and characteristics, relationships between data units and information about the physical placement of the data on storage devices, Cincom said.

The dictionary package was developed in-house which means, according to one spokesman, that it should be more efficient in its linkage to Total than a package written without detailed knowledge of the internals of Cincom's DBMS.

Available now for any IBM-based version of Total, the dictionary costs $275/mo or $11,000. Total itself – without the dictionary – starts at $825/mo depending on the version and options selected.

Cincom is at 2300 Montana Ave., Cincinnati, Ohio 45211.

How a $6 billion giant cuts audit problems to size.

By Karl Kalli, EDP Staff Auditor
Investors Diversified Services, Inc.
Minneapolis, Minnesota

"When it's time to choose software, auditors should get involved.

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COMMUNICATIONS

Bell Figures Seen Unsupported

By Ronald A. Frank
Of the CW Staff

NEW YORK – Despite claims by AT&T and other telephone companies, it is by no means certain that continued competition in telecommunications will cause residential phone rates to rise.

Bell has said residential rates will go up as much as 70% if the Consumer Communications Reform Act is not passed by Congress, but this figure has not yet been backed up, according to Andrew Margeson, staff member of the House Subcommittee on Communications.

Speaking at a session on data communications policy at the recent National Computer Conference (NCC), Margeson outlined the changes that would take place if the Reform Act were passed. "The Federal Communications Commission's (FCC) authority to permit connection of customer-owned terminal equipment would be eliminated.

"The specialized carriers would not be allowed to operate unless they could show the telephone companies weren't interested in their services – a virtual veto right with respect to competition," he said.

"I have serious reservations about such dramatic and extensive restrictions on competition, particularly in an area where the advantages of economic pluralism have so recently been demonstrated by new technologies and services offered by competing suppliers."

Recent FCC decisions which allow a number of suppliers to compete in developing new technologies have obvious benefits, and it would seem desirable to continue this policy, Margeson said.

Another panelist, Larry Darby of the Office of Telecommunications Policy, agreed there is lack of evidence supporting the Bell claims on higher rates. Darby said there has been a "lack of disinterested research." Also there has been "no outpouring of consumer interest" even though users will be affected by the outcome.

Margeson agreed on user disinterest and said the chairman of his committee has received only two letters from consumers.

Darby, who is an economist, said thus far the established carriers have not lost any sales because of the specialized carriers and the independent equipment suppliers. "They are only losing a piece of the growth," he said, noting that in the past the phone companies have captured 90% of the growth factor.

'Ready to Be Signed Off' by NBS

Encryption Standard for Nets Awaits Christening

By John P. Hebert
Of the CW Staff

NEW YORK – A data encryption standard solicited three years ago by IBM for computerized communication networks, is still being considered by the National Bureau of Standards (NBS), but is "ready to be signed off."

The christening of the NBS Data Encryption Standard is "essentially an administrative matter at this stage of the game," according to Dennis K. Branstad of NBS and chairman of a National Computer Conference (NCC) session on Security in Computer Networks here recently.

The encryption standard NBS is mulling over is a "64-bit block enciphering circuit and versatile LSI unit with high throughput capability that was designed for use in a wide variety of applications such as banking terminals, point-of-sale (POS) terminals and processors," Donald L. Heaton, one of the session's panelists, said.

The encryption chip "provides the network system designer with a powerful and cost-effective tool for solving many of the data security problems that currently face the (computer) industry, Heaton, who is with the Collins Radio Group of Rockwell International, said.

A copanelist with Heaton, Howard Wright of Collins Radio Group said the LSI chip would cost about $100.

The session hit on NBS proposed or implemented standards more than once as the other panelists – Harrison R. Burris of TRW Systems Corp. and Frank Heinrich of System Development Corp. – gave their respective talks on "Computer Network Cryptography Engineering" and "A Centralized Approach to Computer Network Security."

Encryption Methods

The three key methods of data encryption are a system of transportation, alphabetic substitution and arithmetic coding, Burris said.

In transposition, the computer data network user would permute the character arrangement in data transmitted from one site to another; alphabetic substitution, he said, involves the replacement of English language characters with symbols from other languages.

These methods, in and of themselves, are particular algorithms which are the "building blocks" of data encryption methods, but won't necessarily be sufficient precaution when used individually to ward off the sophisticated system "attacker," Burris said.

"The attacker knows the system," and in these cases the transposition algorithm,

(Continued on Page 23)

UDS Modem Entry Raises User Problems

By Ronald A. Frank
Of the CW Staff

Analysis

NEW YORK – The introduction of a full-duplex two-wire modem by Universal Data Systems (UDS) at the National Computer Conference (NCC) recently has raised some perplexing problems for communications users.

Until UDS came out with its 12.12 modem, the ability to operate over a two-wire circuit in full-duplex mode was limited to Vadic Corp., which pioneered its VA3400 late in 1972.

The unusual aspect of both the Vadic and UDS modems is that AT&T does not have a comparable data set. Most independent modem suppliers pattern their units after a similar Bell device with the stipulation that the modem is "Bell-compatible." In many cases this means the independent modem is a one-for-one replacement of the telephone company data set – usually with some added features and at a lower price.

The Bell data set often serves as an unofficial industry standard and most independent units pattern their transmission and interfacing features along these standards. But the Vadic unit was always an outcast, since it had no comparable data set after which to be patterned.

Now UDS has introduced its own version, which it admits is not compatible with the Vadic modem. The UDS 12.12 is described by the company as having some additional features at a lower price. It costs about $600 while the Vadic unit costs about $800, according to a UDS spokesman.

There are about 6,000 Vadic VA3400s installed, and soon there will undoubtedly be hundreds of the UDS modems also in operation. None of these units will be able to transmit data to modems made by the other supplier.

Vadic is reportedly studying whether the UDS data set has infringed on ideas patented in the VA3400. UDS spokesmen say the 12.12 was developed from the ground up. Users don't care much about patents, but they do like to have modems that are compatible with each other.

Meanwhile, AT&T is known to be developing its version of a 1,200 bit/sec data set that will operate over a two-wire facility. Up to now Bell has not introduced this unit, but some time ago it was reported the product had been shown to some prospective large users.

If AT&T decides to introduce its own model, will it be compatible with Vadic or UDS or will it set a third standard? As of now, an AT&T spokesman said there are "no plans" to introduce such a data set.

Meanwhile, users who are shopping for a 1,200 bit/sec data set will have to make some careful trade-offs if they want to operate in full-duplex mode over two wires.

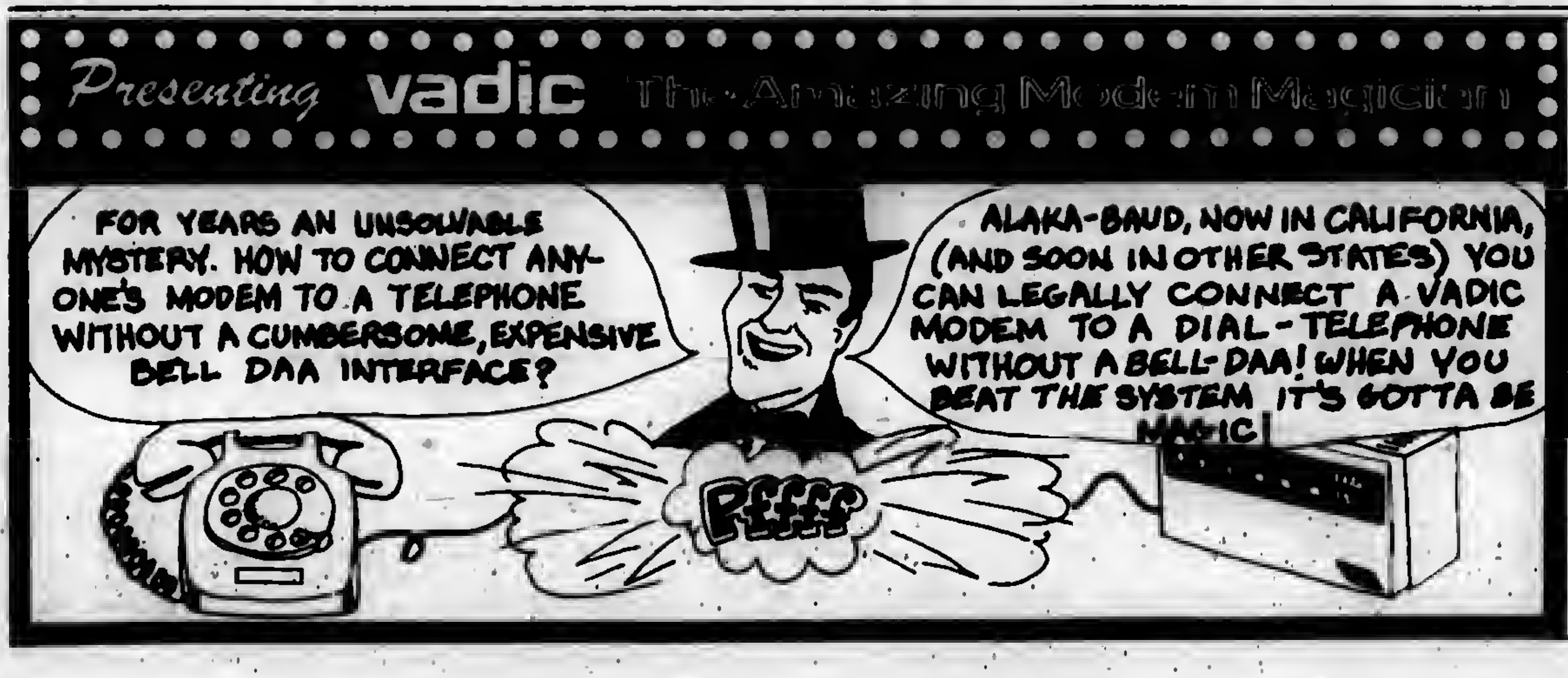
Seminar to Address Reform Act

NEEDHAM HEIGHTS, Mass. – A national seminar on the impact of the Consumer Communications Reform Act will be held on June 29 in New York City by the Association of Data Communications Users (Adcu).

The session will also include an analysis of AT&T's proposed Multi-Schedule Private Line service by Dr. Dixon Doll, a communications consultant. It will include corporate impact of the MPL proposal and its relationship to specialized carrier offerings.

The Reform Act and what it means to users will be discussed by Herbert Marks, a Washington attorney and counsel for the Independent Data Communications Manufacturers Association.

Adcu is a recently formed organization of data communications users. The seminar will be at the Holiday Inn on 52nd St. in New York with free admission for Adcu members and a $20 charge for nonmembers. Details of the meeting are available from Robert Kaufman, vice-president at Damon Medical Services Group at 115 Fourth Ave., Needham Heights, Mass. 02194.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Datapoint Printer Among Products Debuting at NCC

By Ronald A. Frank
And John P. Hebert
Of the CW Staff

NEW YORK – Data communications users visiting the National Computer Conference (NCC) here recently easily found product introductions.

In addition to the devices noted last week [CW, June 14], there were diverse offerings from other companies.

Datapoint Corp. unveiled the Model 9232 Freedom matrix printer which was designed, developed and manufactured by the company for dispersed business data processing.

The printer features an integrated bipolar microprocessor for forms handling and control of both the print head and tractor feed mechanisms.

The processor is said to maximize machine throughput by controlling bidirectional printing, accelerated "white space" spacing and accelerated line feed slewing at print rates equivalent to a maximum 350 char./sec, the spokesman said.

Each line of text is buffered before printing by the control program, which is contained in a permanently programmed read-only memory (ROM). The memory contents cannot be accidentally modified or erased by the user, the company said.

The Freedom printer has an 80 char./sec print speed for "normal text" in a 132-column, 5 by 7 dot matrix format at switch-selectable spacing of 6 or 8 line/in.

The printer reportedly is capable of speeds from 25- to 350 line/min depending on the application.

A 96-character upper- and lower-case Ascii font is supplied as standard equipment; international character sets are available on special order, Datapoint said.

An optional dual-tractor paper feed design allows handling different forms types, the spokesman added.

The Freedom printer carries a purchase price of $3,950 plus $100 for installation and $30/year for maintenance which also covers all repairs which may have to be made, the spokesman said.

The Model 9234 dual tractor option costs $500, plus a $10 installation fee and a $5/year maintenance charge.

Leases of 90 days and one, two or three years are also available, it added. Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78284.

TEC Brings Model 1445

TEC, Inc. in Tucson, Ariz., brought out its Model 1445 conversational-mode teletypewriter replacement.

The terminal operates at 15 switch-selectable transmission speeds from 50- to 9,600 bit/sec in serial asynchronous mode, the company said.

It displays 1,920 characters in an 80-character (5 by 7 dot matrix) by 24-column format on a nonglare 12-in. CRT screen; available interfaces include RS-232C, TTL or current loop for half- or full-duplex communications, TEC said.

Options for the Model 1445 include lower-case characters for display of the 128 Ascii character set; 40- by 24-character display and extended keyboard with Ansi 11-key numeric pad, it added. The terminal is priced at $1,495.

Xerox Terminal Bows

Xerox Corp. in El Segundo, Calif., introduced the 1700 interactive terminal which it described as a replacement for the earlier 3010 terminal. The microprocessor-driven unit operates at 10-, 15- and 30-char./sec using Ascii or APL characters.

The 1700 is available in a graphics mode for drawing charts and similar applications. The 1700 costs $2,981 or $130/mo on a one-year lease. A receive-only Model 1710 without keyboard is priced at $2,620 or $121/mo on a one-year lease.

Universal Data Systems in Huntsville, Ala., introduced a 1,200 bit/sec modem that can operate in full-duplex mode over a two-wire connection. Using "coherent phase shift keyed modulation" previously utilized in 2,400 bit/sec modems, the Model 12.12 includes both local and remote test features.

The 12.12 is said to use an interface discipline identical to the Bell 103 and 113 data sets. The modem can operate at full-duplex data rates of 150-, 300-, 600- and 1,200 bit/sec. It is priced at $600 or $20/mo on a 36-month lease.

Magnavox Display Systems in Fort Wayne, Ind., introduced the Orion-60 graphics terminal which includes a microcomputer and plasma display. A variety of firmware options described as "user-installable" are available, including incremental vector capability, APL character set and alternate control codes. The system costs $5,995.

Tab Products Co. in Palo Alto, Calif., brought out the Model 501C data entry microprocessor-based keypunch, which has all its capabilities stored in Prom, Tab said. The on-line terminal provides optional communication through an RS-232C interface at speeds from 110- to 9,600 bit/sec in either synchronous or asynchronous modes, providing data transfer capability between the unit and any CPU, peripheral subsystem or terminal, Tab said.

The basic 501C is priced at $6,850; the communications option is an additional $1,250.

Terminal Integrates RAM, Modem in Micro

HUDSON, Mass. – The MT-32 Merchant Terminal from Datatrol, Inc. was designed for use in retail transaction situations, including checking guarantee, check verification and credit authorization.

Random-access memory (RAM) is contained in the microprocessor, as is a modem. In outer appearance, the terminal is comprised of a 16-button keyboard, 12 message and prompting windows and an 8-digit numeric LED display, the company said.

Two optional devices available are a wipe-through magnetic stripe card reader and a personal identification number pad.

The MT-32 can be expanded to include a receipt printer to perform full electronic funds transfer system transactions, Datatrol added.

The terminal communicates asynchronously at 1,200 bit/sec but is capable of transmission speeds of 2,400- and 4,800 bit/sec, a spokesman said.

The cost of a basic MT-32 with integrated microprocessor and modem is $700, the spokesman said from Kane Industrial Drive, Hudson, Mass. 01749.

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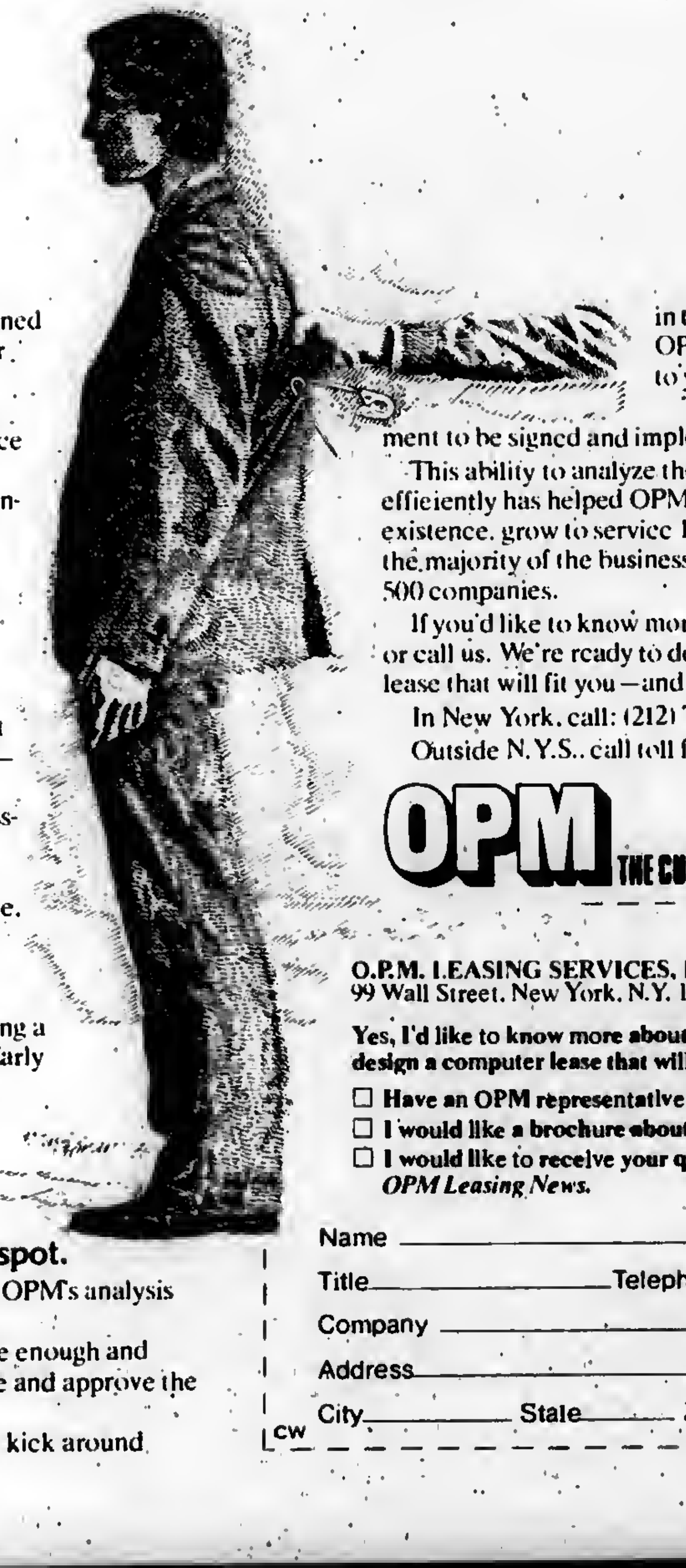

Despite Present Limitations

Net Testing Seen Demanding Much Future Attention

By John P. Hebert
Of the CW Staff

NEW YORK – True end-to-end testing of communications networks has been very limited up to this point, according to Eric Wolfe of Bolt Beranek and Newman, Inc., one of a group of people who spoke here recently at a National Computer Conference (NCC) session on "Network Measurements."

"Network testing techniques have not been the subject of a lot of research, but they will be something that will get a lot of attention in the future," he predicted.

"There is a need to do some research in network testing today.

Before building a network, question what testing facilities should be built into the system."

Part of this planning should include instrumentation – determined by asking how much and what kind of testing will have to be performed on a continuing basis, he noted.

For example, "how can you know if a front-end processor improves or hinders performance in a network?" he asked. The testing of a device such as this is "expensive to do, but it should be done because there is no literature available and it is a necessity," he said.

"Network testing is costly because you usually have to design the tests and interpret your own results. The only thing I know of that is more costly is to not do network testing," Wolfe said.

Other panelists in the session agreed with Wolfe on the point he made about built-in network testing functions.

"We will have to think in those terms in the future," according to Holger Opderbeck of Telenet Communications, Inc.

Another panelist, Don Allen of Bolt Beranek and Newman, Inc., said "when you look at the measurements of your network, you will be constantly surprised by what you see.

"Network testing facilities should be a part of the original design rather than an afterthought," he added.

A new resource-sharing technique which utilizes broadcast channels was discussed by one of the people working on its development for the Advanced Research Projects Agency (Arpa) at the University of California at Los Angeles (UCLA).

Fouad A. Tobagi said the system, called the Packet Radio system, is another example of a packet-switching network. It is now in the design phase, but will shortly be in the testing phase.

It is logical that Arpa is the system developer because the agency was first to utilize packet-switching techniques, having done so in 1969, Tobagi said.

The Packet Radio system has three functional components: terminals, packet radio stations and packet radio repeaters used as store-and-forward relays, he said.

A hierarchical routing algorithm is used to make the system look like the routing in a point-to-point network.

As was the case with experimentation with the development of the Arpanet in 1969, the Arpa Packet Radio system incorporates the ability to measure network behavior, he said.

Encryption Standard Awaits Christening

(Continued from Page 21)

for example, won't help much, he added.

But the combined methods of transposition and substitution as proposed by the NBS can significantly reduce the probability of a successful attack, he said.

Other encryption methods described by Burris included clock synchronization implementation to restrict data access (like a timed bank vault) and different keying methods, such as auto key systems.

These methods are necessary in computer networks where sensitive information is regularly transmitted, he indicated.

'Classic Problem'

Calling the restriction of information from unauthorized persons a "classic problem," Burris said encryption of some kind is needed for the protection of system performance and the restriction of the system's resources to authorized persons.

Frank Heinrich, on the other hand, suggested a centralized approach to computer network security to provide an environment that wouldn't be compromised.

The types of data security violations include unauthorized access, where a legitimate user has no authorization for a certain type of information contained in the network; forged user identity or penetration; counterfeit network resources such as bogus terminals and counterfeit host CPUs; network communication threats – line tapping, for example; and misrouting or misrouted messages – intentionally or otherwise.

Network Security Center

The network security center (NSC) protects these layers of network design if it was implemented at the network resource or terminal level, he said.

"The NSC should be a separate, secure facility which provides user identification authorization and authentication and which maintains network access control information," Heinrich said.

The NSC should verify the user's identification and require a password based upon secure, stored information. If access is approved, the user should receive cryptographic data communications, Heinrich said, stressing the importance of cryptographic techniques.

An NSC can be operated with a minicomputer, like the network he has worked with which had a data base accessed by about 1,000 active users with about 3,000 terminals.

In that particular data base, 750 byte/user was required of the NSC, with a secondary storage of .76M bytes, he said.

Heinrich lauded the proposed NBS encryption standard, saying it provides the computer network system with an encryption method which is not affected by throughput and allows the quick implementation of security techniques in a low-cost manner.

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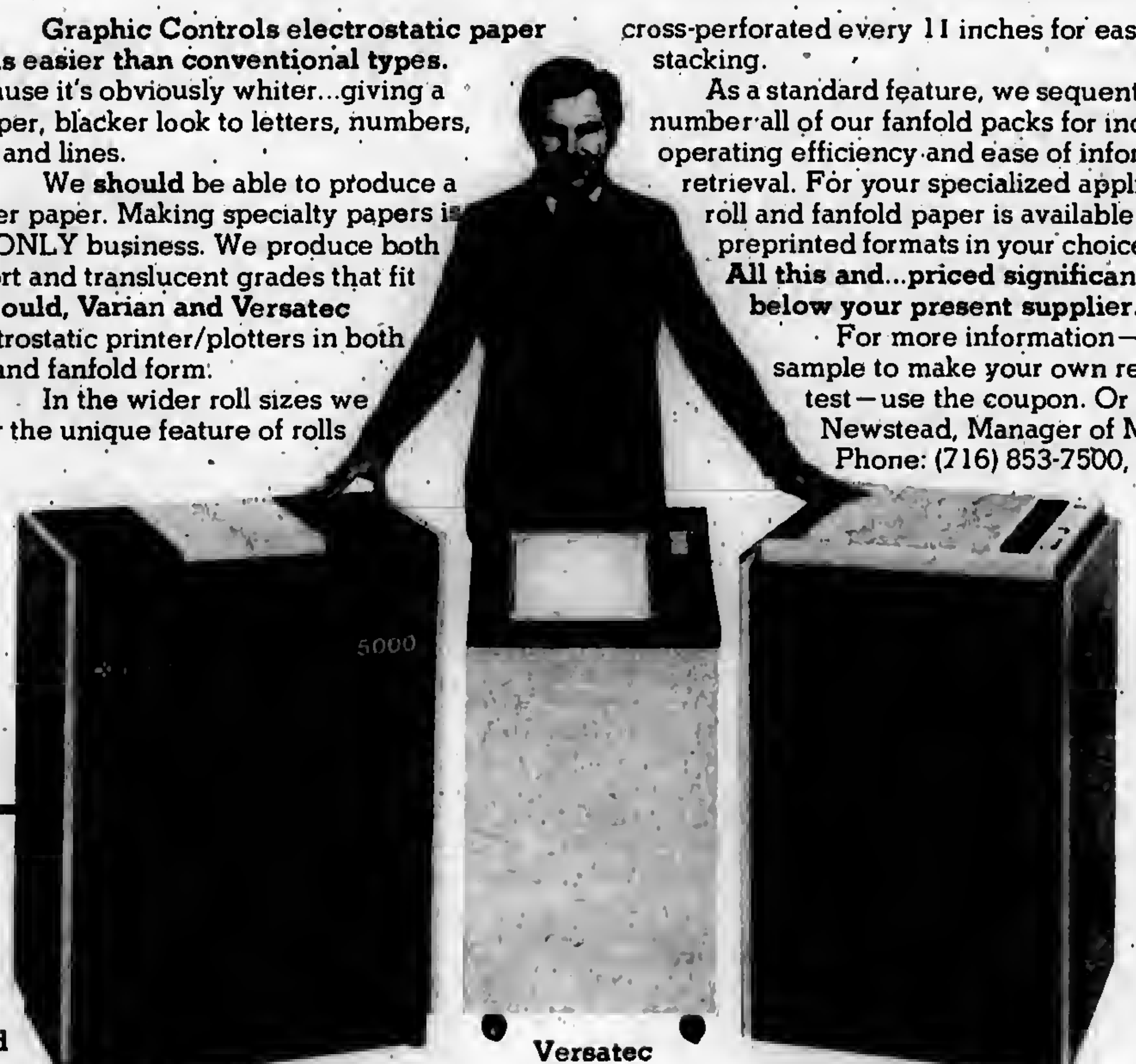

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Terminal Transactions

Sweda Adds System for Hoteliers' Use

PINE BROOK, N.J. – Sweda International has an entry for the innkeeping industry with a minicomputer-based accounting, data collection and point-of-sale (POS) system.

The 800/80 Hospitality System incorporates what the company called a proven hotel/motel software system, the Sweda System 80 minicomputer, CRT and POS terminals, line printers and disk storage in a stand-alone, on-line environment.

System features were designed to facilitate reservations, registrations, guest ledger accounting, room status reporting, name search, automatic room selection, the preparation of welcoming letters for guests, reservation deposit letters, travel agency accounting and night audit operations, the company said.

Up to two years of reservations and information on up to 3,500 travel agents can be stored on-line in the system's 5M-byte, 16-sector rigid disk and can be called up by the 32K-byte core minicomputer, a spokesman said.

Accounts payable and receivable, general ledger, payroll and archive files are also available on-line through the system, he added.

Peripherals available with the system include basic Hazeltine 2000 CRT displays, a choice of line printers with speeds of 60- and 200 line/min and up to eight Sweda Series 800 POS terminals, the company said.

Operations at the front desk requiring entry through the CRT keyboard are in "conversational language," according to Sweda.

The price for a basic 800/80 system including software, the System 80 CPU, two CRTs, two Centronics line printers (models 306 and 101) and two Series 800 POS terminals is about $60,000, depending on user requirements, the spokesman said.

Delivery is in 90 days, he added from 34 Maple Ave., Pine Brook, N.J. 07058.

DEC Micro-Based Text Editor Slated for Printers, Publishers

MAYNARD, Mass. – Digital Equipment Corp. has introduced a microcomputer-based, text-editing terminal for the printing and publishing industries.

The VT71/T desktop video display terminal was designed for use with computerized editing and typesetting systems and incorporates variable-speed pan scrolling and a large-character, glare-free display, DEC said.

The terminal contains DEC's LSI-11 programmable microcomputer which permits internal storage of up to 40K characters of copy.

The microcomputer comes with 12K- or 28K words of memory.

In addition to the standard typewriter keyboard, the VT71/T offers two color-coded 18-key keypads for text editing and copy dispatching as well as 16 memory keys at the top of the standard keyboard that enable the user to custom-design certain editing functions, the company said.

The terminal's 15-in. screen displays 19-point characters in a 10 by 10 dot matrix and in a 24-line by 80-character format, DEC said.

Editing features include a "search and replace" function and an UNDELETE command which is said to allow the operator to restore copy deleted by mistake.

The terminal is reportedly compatible with all other DEC editing terminals and typesetting systems. The VT71/T can be added to or replace existing configurations or can be mixed with DEC's VT61/T or VT20B editing terminals to create new systems, according to a company spokesman.

A basic VT71/T, including the LSI-11 microcomputer with 12K words of memory, costs $7,250. A full 28K memory unit costs $9,750, with first deliveries scheduled for the fourth quarter, DEC said from Maynard, Mass. 01754.

DEC VT71/T Editing Terminal

MDS Reconfigures, Cuts Price of 2300

PARISIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) is offering reduced prices on the Model 2300 minicomputer-based, bisynchronous communications IBM Hasp workstation terminal system.

The stand-alone terminal system includes the ability to choose seven terminal protocols from a menu format, a minicomputer with 4K bytes of core, a CRT display, 230 Kbytes of disk storage and a keyboard for direct data entry, which can be programmed for job setup, an MDS spokesman said.

The standard terminal system controller, an IBM 360/20 IBM Hasp multileaving workstation, configured for low-volume configurations with a Model 2453 400 card/min reader and a 30 char./sec bidirectional printer, is priced at $591/mo on a three-year lease, the company said.

The same system equipped with a 100 char./sec printer costs $676/mo for three years, it said.

A third configuration includes the System 2300 Hasp terminal with the above equipment and the 300 line/min drum printer and is priced at $718/mo on a three-year lease. All prices include maintenance, the spokesman said.

The spokesman said the third configuration option had cost about $1,000/mo on a three-year lease before the price reductions.

Configured as a remote processing/transmittal workstation, the System 2300 with the 30 char./sec printer rents for $399/mo, maintenance included, over a three-year period. This basic configuration carries a purchase price of $10,400, the spokesman said.

MDS can be reached at 1599 Littleton Road, Parsippany, N.J. 07054.

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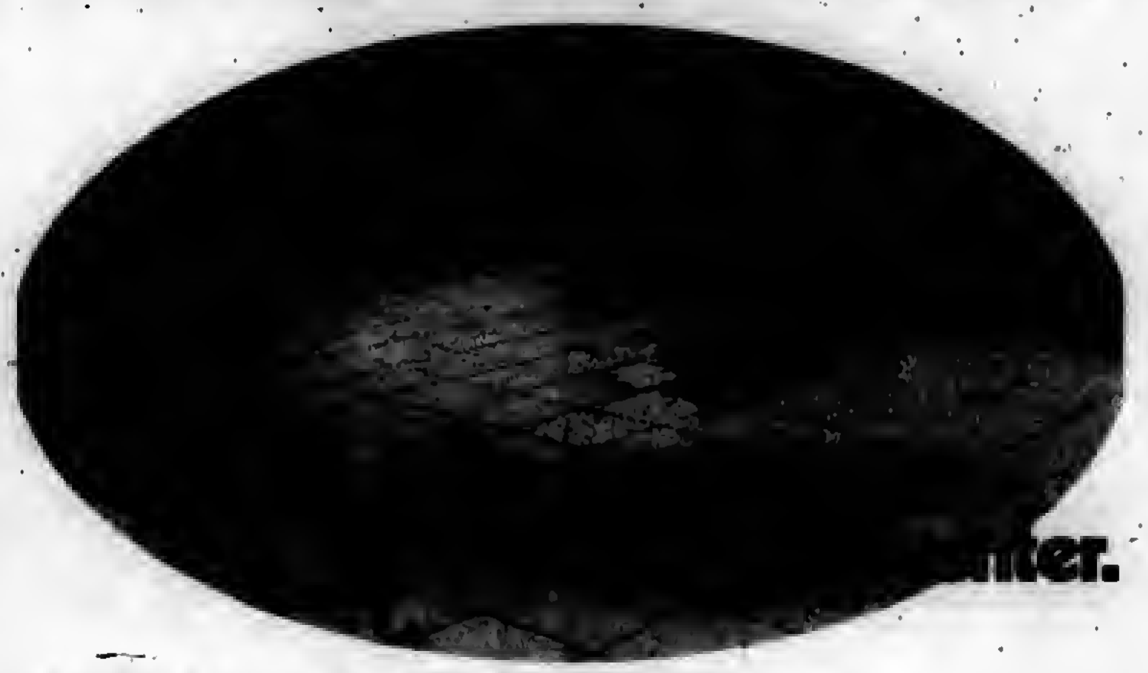

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Bits & Pieces

Three Mass Memory Systems Purchased by OSI From PIC

SANTA CLARA, Calif. – Optimum Systems, Inc. (OSI) and Precision Instrument Co. (PIC) have reached an agreement under which OSI will purchase three PIC System 190 Laser mass memory storage units.

The systems, valued at $1.2 million, will be installed in OSI's data centers in California and Washington, D.C., in what is said to be the first commercial use of this technology outside the U.S. government.

The System 190 uses laser technology for recording and reading digital information. In their initial configurations, each System 190 will contain 16G bytes of on-line user data.

Pillows Act as Fire Retardants

CLIFTON, N.J. – Lensclean, Inc. is offering a fire-retardant, a malleable 12 in. by 12 in. cloth bag, which is said to be particularly suited to computer room operations with a floating floor.

In addition to serving as retardants to fire and smoke, the Fire Plug Pillows help check the flow of air conditioning emanating through the open areas in the floor.

Lensclean is at 31 Styertowne Road, Clifton, N.J. 07012.

Tape Rack Holds Seals, Canisters

The dual-purpose Compurac computer tape rack manufactured by Morton Industries, Inc. is designed to hold both canisters and seals in combination without any adjustment.

The rack comes in six models with capacities ranging from 40 seals or 24 canisters on a one-level rack to 240 seals or 144 canisters with the six-level model.

Delivery is from the firm at 33120 Arlesford Drive, Solon, Ohio 44139.

Qume Printers Based on MOS Micro

HAYWARD, Calif. – A family of single-chip MOS microprocessor-powered character printers has been announced by Qume Corp.

The Sprint Micro 3 series includes the Widetrack, which features a carriage twice the width of conventional printers and operates at speeds up to 40 char./sec, according to the firm.

Other members of the family include the Sprint Micro 3/35, 3/45 and 3/55, all of which use standard print wheels, and the Micro 3/X30 and 3/X40, which feature metallized print wheels.

Prices in OEM quantities of 100 range from $1,070 for the 3/35 to $1,700 for the Widetrack. Delivery is 30 days from the firm at 2323 Industrial Parkway West, Hayward, Calif. 94545.

Designed for College Research

System Aids Study of Multiprocessing

By Esther Surden
Of the CW Staff

NEW YORK – A multiprocessor system developed at the University of Rochester in Rochester, N.Y., was designed to investigate how operating systems can be designed in a multiprocessor environment and how the labor that must be performed is best divided between system software and processors, Neil Wilhelm of that university told an audience at the National Computer Conference (NCC) recently.

The multiprocessor system, designed as a research and investigative tool, had to have more than two processors. The system also had to be constructed so the user could change processors quickly. The multiprocessors also had to have a flexible I/O system and a large word size to simplify data transfer, he noted.

The university decided to use four processors that would communicate to the common memory via a memory bus and to special functional units via selector-type channels. Special low-speed devices would be connected by other low-speed channels, he said.

The researchers also tried to achieve a fast overall microinstruction rate. The independent processors were not to be aware of each other's existence, and the data paths were to be 64 bits wide.

In designing the system, the researchers used what Wilhelm called the Control Data Corp. approach. They used a cyclic barrel of registers rotated through a fixed set of hardware. The processors consisted of 64 registers each with 64 bits and shared all other resources. This resulted in less hardware, lower cost and fewer wires, Wilhelm noted.

Some of the features the team tried to achieve with the system included field extraction capability with each microinstruction, conditional branching with each microinstruction, modular automatic subroutine and return address stacking, indirect specification of registers, functions such as priority decode and microinstructions as closed instructions.

DEC Multiprocessor System

Another speaker, Robert M. Glorioso, outlined the method his team of researchers used when creating a modular multiprocessor system using Digital Equipment Corp. LSI-11 microcomputers.

The researchers, who received help from DEC, tried to keep the cost of the central control to about $1,000, he said. The operating system had to be incorporated on either hardware or firmware; processors had to be added without catastrophic results; the system had to appear as a mid-sized time-sharing system and provide quick response and access to facilities, he said.

Another feature of the system would be that if a user were bogged down he could plug in a few more processors to cope with the problem.

The network that was constructed had all processors connected to all other processors. Fundamental units were allocated to different kinds of tasks. One was assigned to program development and one to file management.

The interprocessor controller has a large bus that allows communications with all functional units and with a switch that polices communications between the units.

The system works as follows: When a user asks for a service, the service is allocated to one controller. The task goes into a ready state and the controller looks for a resource to accomplish the task. The controller then assigns a processor to do the task.

The task can be running, terminated, request a file or wait. If the task runs too long, it may reach a time-out state and be sent to a normal state until a functional unit is free, he noted.

There are some problems with deadlock on the system that have to be resolved, he said. A member of the audience pointed out that the system is extremely fault-sensitive because, if one node goes out, all high-speed devices could be out of order.

NCC Hosts Release of Products From Xerox, Ampex, Recortec

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – In addition to the printers and data entry equipment announced at the recent National Computer Conference (NCC) [CW, June 14], several other products made their debut.

For example, Xerox Corp. in El Segundo, Calif., introduced a model of its 1200 nonimpact printer line that can operate either off-line or on-line to IBM 360s and 370s. The Model 2 operates off-line from tape, while in the on-line mode it emulates an IBM 3211 impact printer, the firm said.

The unit uses xerographic techniques and prints at 4,000 line/min with lease prices starting at $1,600/mo and a purchase price of $175,000,

Also Xerox added a 7-track tape input capability to the 1200, the firm said, making it compatible with 7-track tapes having BCD even parity and binary odd parity.

In other action, Ampex Corp. of Marina del Rey, Calif., introduced the ARM-2365E, which is an expanded version of the 1M-byte mainframe memory introduced in 1973. The unit allows up to 8M bytes of memory on a single port. A 1M-byte configuration is priced at $130,000, the firm said.

NSC Offers 256K-Byte Memory

SANTA CLARA, Calif. – A self-contained solid-state bulk data memory system that can store 128K words of 22 bits (256K bytes) and stands 5.25 in. high is available in quantity from National Semiconductor Corp. (NSC).

Known as the Model NS3, the system is configured into four modular memory cards, a timing and control card, an optional special features card and an optional custom interface card. Card size is the standard 11.75 in. by 15.4 in.

Each memory card has a maximum capacity of 32K by 22 bits (64K bytes). The cards can be modified to meet the requirements of individual systems. Storage capacity is adjusted through board depopulation.

The basic storage element is NSC's Model MM5270 4K dynamic random-access memory (RAM) which permits all levels to be compatible with those of bipolar TTL devices, the firm said.

Optional features include custom interfacing, byte control, error check and correction (or parity) and double word control with a word structure of 44 bits. A remote self-test unit which exercises the system is available as an option.

Modes of operation include Write, Read and Read-Modify-Write. Access time is 280 nsec, and cycle time for either the Read or Write mode is said to be 430 nsec. The Read/Modify/Write cycle takes 610 nsec plus the time needed by the user's equipment to modify the data.

Memory refresh can be implemented for individual applications either in a synchronous mode or an asynchronous mode, allowing "hand shaking" with the central processing unit, the firm said.

The price of a full NS3 system with a chassis, 128K by 22-bit organization and power supply is $11,000, available from 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

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SPECIFIC FONTS ______________
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We build, or help build, computer systems. At one exteme we take full project responsibility: at the other, we provide a programmer or analyst—on a daily basis—to augment your team. However we fit in, we all work in a systematic manner. We use leverage tools. And we try **to make things a little better.** For example, our Hoskyns Access Method for Digital Equipment Corporation's PDP/11 Series is a superior indexed sequential data base facility:

. . . from Original Designs . . .

We build custom systems from client specifications or including design. At $4 to $6 per COBOL statement (versus a $6 to $10 in-house average), we may not save all that much money. But we do provide schedule flexibility, specialist skills and **assured results in demanding situations.** The system sketched in the box (we carried full project and technical responsibility) illustrates our capability:

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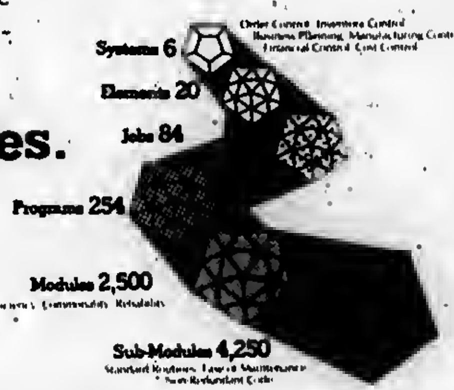
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Business Planning, Manufacturing Control
Financial Control, Cost Control
Elements 20
Jobs 84
Programs 254
Modules 2,500
Sub-Modules 4,250

You Get a Quality Job . . .

However we build the systems, our approach is careful and conscientious. We work to fixed price, performance and delivery contracts. We provide a free maintenance period. We design robust systems **to produce results** in the real world:

SYSTEM CHARACTERISTICS	PROGRAM ATTRIBUTES	MMDS TOOLS
Convenient Input/Ouput Operability/Recovery Audit Trail/Error Control	Testing Implementation Alteration	Systems Analysis Language Decision Table Processor Modular Programming Test Harness

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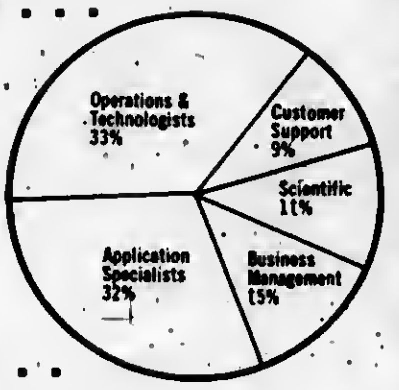
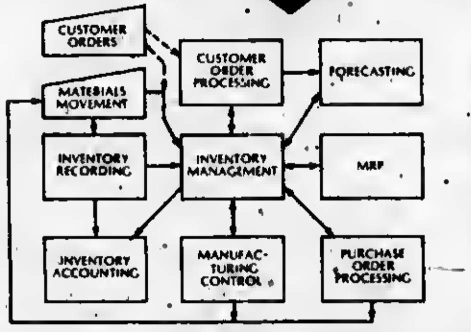
Our people are responsible professionals. Our approach is a modest, cautious one: a systematic method, use of leverage tools and a **respect for individual ability.** As a company, we provide well thought out products and services in a reliable and economic way. We now have 1200 staff members and sales in excess of $40M p.a.



You Get MAS Integration . . .



MAS offers meticulous fit, Immaculate finish and demonstrable performance at miniscule cost. If that's not enough, MAS allows you to build a **totally Integrated system:** piece by piece, in any sequence, with the certainty that it will all fit together. Take the MAS Inventory Control links:

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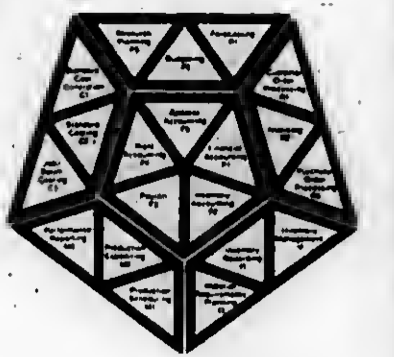
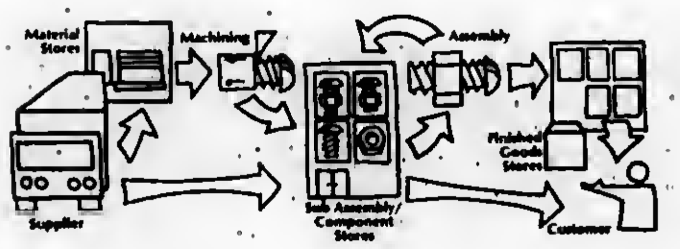
If you need computer power as well as computer systems, MAS on RJE is a five star service. The **MAS systems cost you nothing** through one of our RJE terminals installed in your office. You pay only for set-up, and any tailoring or implementation you may elect to have done. That's it. At no cost you have unrestricted access to the complete range of MAS systems. The RJE running charges are modest.



MAS Tailored Fit . . .

Where MAS can be used, you get a system to your exact specification with a finish better than custom. Only by spreading the cost of detailing over many users can such refinement be afforded. And **MAS fits better than custom.** Take inventory control as an example. MAS models the complete inventory situation: resources and movements. Because it accurately reflects the real situation, it can always be tailored to fit individual requirements. And, because it's built to flex, MAS continues to fit your developing needs:



$1 per Program Statement . . .

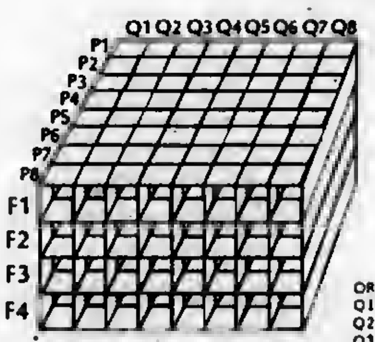
With COBOL code averaging $6 to $10 per line, MAS costs less than $1 per immaculate statement—standard. **Tailored to include special facilities,** it isn't likely to reach $2 per line. The $6/$10 norm? As follows:

	High	High	Low	Low
Cost/ Man Month*	$2,400	$4,000	$1,440	$2,400
Statements/ Man Month	240	400	240	400
$'s/ Line	$ 10	$ 10	$ 6	$ 6

*Includes Fringes Training Machine Time

Proven Performance . . .

Over 550 MAS systems are now In use—worldwide. You can see them working, study the documentation and **see the results produced.** So you know that there's no risk and the performance is proven. And you'll appreciate the refinement that comes with experience. For example, the MAS Inventory Control System provides a complete spectrum of inventory policies:

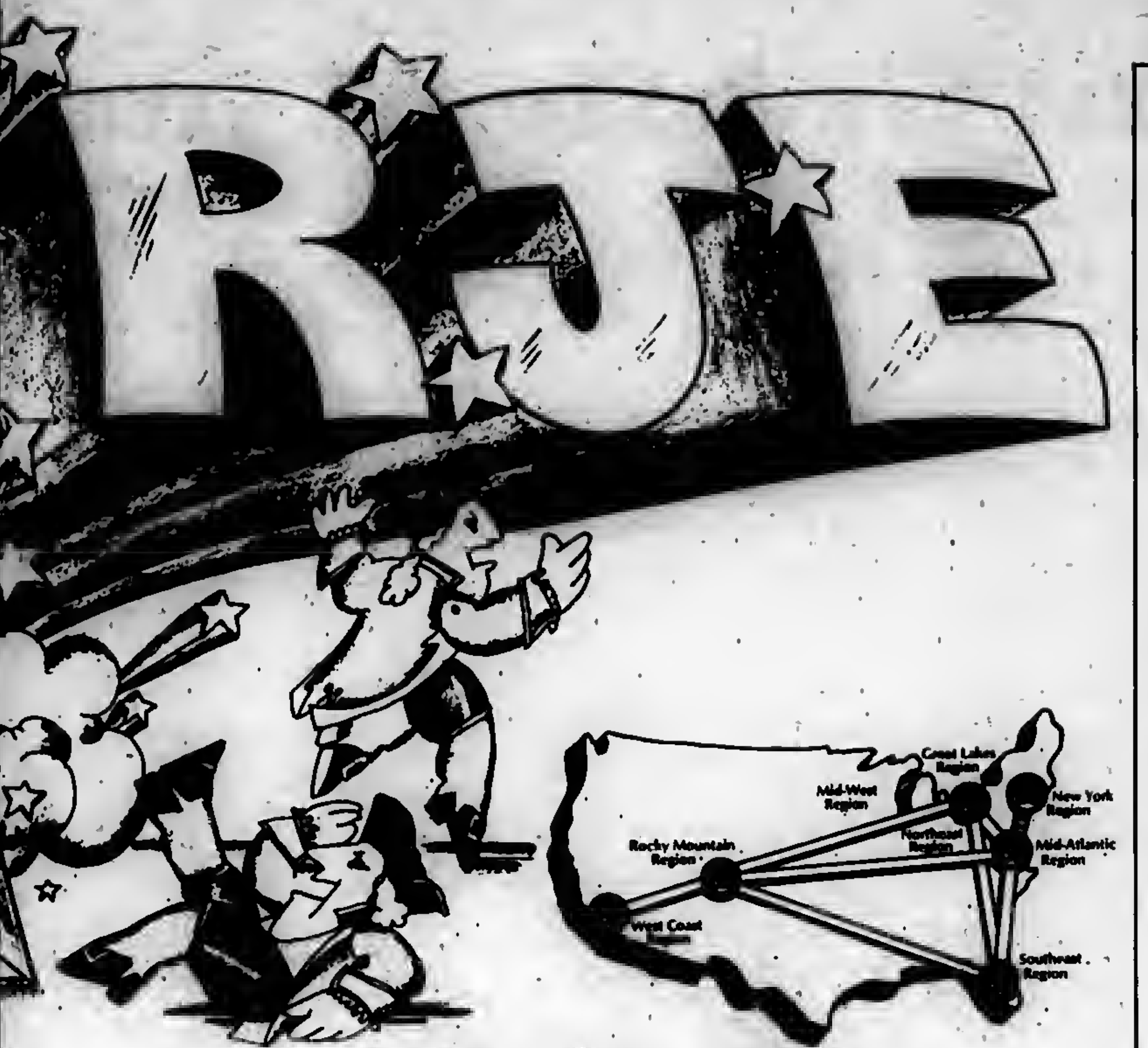


ORDER POINT
P1 Calculated From Service Level
P2 Calculated From Safety Factor
P3 Calculated From Safety Period
P4 Out Of Stock
P5 Back Order
P6 Fixed Quantity
P7 Individual Period
P8 Intermittent Period

FORECASTING
F1 Single Level Exponential
F2 Exponential Plus Trend Correction
F3 Statistical Plus Management Supplements
F4 Manual

Note: All of above may be order or usage based; and include consistency and responsiveness checking.

ORDER QUANTITY
Q1 Economic Batch Quantity
Q2 Part Period Balancing
Q3 Discrete Orders
Q4 Fixed Quantity
Q5 Jobbing Orders
Q6 Discrete Period Cover
Q7 Multiple Period Cover
Q8 Replenishment



We Also **Run** Computer Systems . . .

We run systems for clients: as a **supplement** to the use of in-house facilities, as an **alternative** to acquiring a new computer, or as a **replacement** for an old one. Client facilities and our central computers are linked by a nationwide network:

. . . on IBM 370/168 Computers . . .

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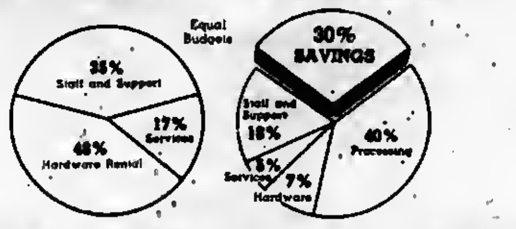
370/145 CDC 3500
370/155 EAI 8400
DISKS:
2314, 3330 - single and double density
Drums, Magnetic Tapes, Plotters, Microfilm

SOFTWARE
TSO IMS DBOMP
SYS/HASP
OS/MVT/HASP
DOS DOS/VS
Emulation Assembler
COBOL ANS FORTRAN
PL/1 RPG SNOBOL
Application Software
Scientific Software

We use large, **economy of scale**, IBM 370/168 computers at our centers, with smaller IBM computers tied in as satellite stations. You have as much, or as little, local processing power as you wish. Planned overload is floated back to the versatile /168's:

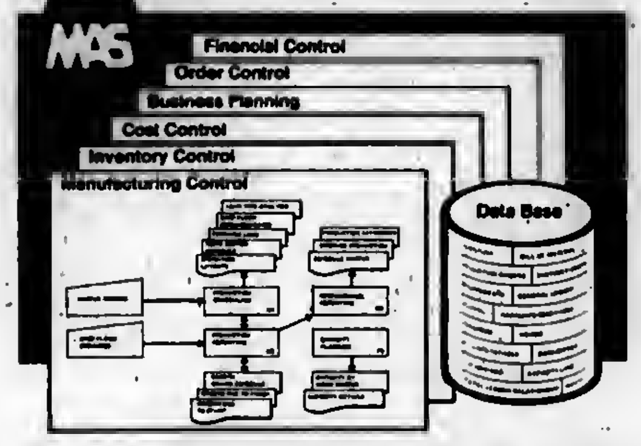
. . . through RJE Terminals in Your Office.

Example of in-house versus remote job entry computing costs.



Most of our clients operate through Remote Job Entry (RJE) terminals installed in their offices. They get all the **convenience, responsiveness and control** of an in-house computer. Card readers, videos and printers (and, maybe local storage and processing power) are handled just as you would an in-house machine. Economy of scale and utilization makes for significant savings:

You Get Data Processing Professionalism . . .



With RJE Computing Power we like to work in a clean, transparent arrangement: it's effectively your own computer. But we know how to produce **systems that perform**, and we know how to manage a data processing activity successfully. So—if you can use our systems expertise, or our data processing methodology and tools—they're yours for the asking:

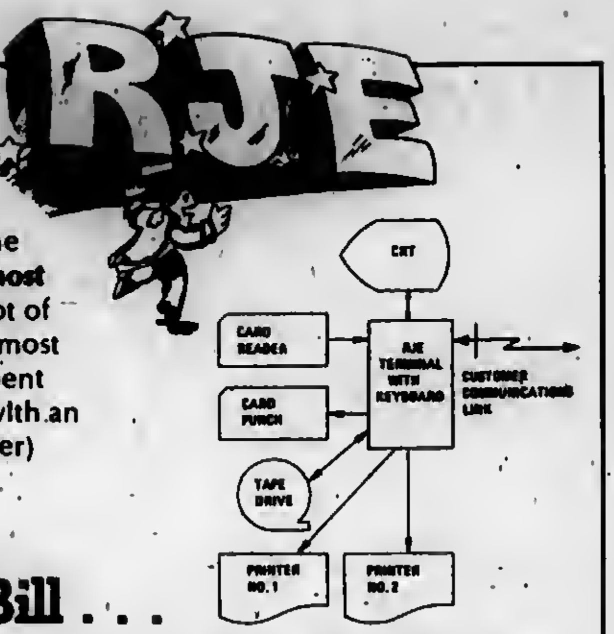
You Get Convenient Computing . . .

You run the RJE terminal just like your own computer. Passwords protect. **Priorities leave you in control.** The flexible configuration expands to handle your loads and contracts, when you don't need it, to save you money. You reach remote subsidiaries. And you have up-to-date software and complete technical backing.

SECURITY	
FIELD	FUNCTION
Password I.D.	Jobs, data sets, libraries, programs
Account #	Protection hierarchy
Accounting I.D.	Cost control
Location	Protection hierarchy

PRIORITY	
CLASS	TIME INTO EXECUTION
I	Interactive
Q	0 minutes-15 minutes
O	15 minutes-1 hour
J	1 hour-4 hours
K	4 hours-12 hours

The Elastic Configuration . . .



If you use an RJE facility, the most noticeable feature is the **almost limitless** power. The /168's do a lot of work in a hurry; and they have almost any capability you'd want. This client replaced an in-house computer with an RJE set-up (adding a second printer) while saving money:

The Shrinking Bill . . .

	BEFORE	AFTER
EQUIPMENT NO. JOBS/WK	360/50 2000	DATA 100 3000
NO. OPERATION SHIFTS	3/DAY, 7 DAYS/WK	2/DAY, 5 DAYS/WK
NO. DAYS TO CLOSE MONTH END	5	2
TOTAL COST	$75K/ MONTH	$26K/ MONTH

With RJE you **pay only for what you use.** You don't pay for a machine that's used 20 hours on one day per month—and 5 hours every other day. You don't configure your local machine for an extreme job that represents 5% of your load. And you know that every second of machine usage you save will come right off your cost. The economics for the configuration above:

The Technological Umbrella . . .

With over 50 technical specialists and large-scale equipment we provide a complex VS, TSO, IMS, CRJE environment. This, with the compilers and utilities we offer, gives you a lot of power; and we make sure that the system is fully up-to-date and exercised. On top of that we make available—at no cost—our proprietary **methodology and tools**:

FREELY AVAILABLE TOOLS

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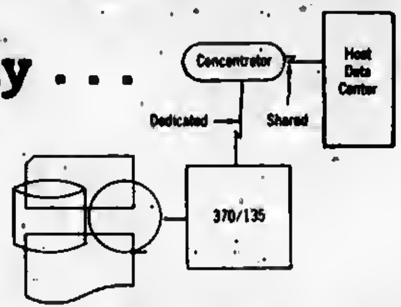
- Data Specification Language (HSL)
- Decision Table Processor (Tablemaster)
- Modular Programming Test Harness (Testmaster)
- Off-the-shelf Modular Application Systems (MAS)
- Modular In-House Training System (MITS)

You Get RJE Flexibility . . .



With RJE you get limitless capacity, remarkable savings and state-of-the-art technology. So you're always **right up to date**. You avoid the inertia, the heavy system maintenace burden and the under-utilization cost of your own facility. You get the benefit of the super configuration and powerful software. And you can mix-and-match economic local facilities with the central /168 resource (for peak loads, large jobs or special software work).

And You Get MAS on RJE ★★★★★

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BUFFALO: Bud Feely (716) 634-8210	**DENVER:** Norwood Robb (303) 761-3781
ORLANDO: Ellis Tidwell (305) 855-1050	**LOS ANGELES:** Dick Condon (213) 328-0660

LONDON: Neville Cerfontyne 242-1951

For More Information on MAS and/or RJE, just return the coupon or—if it's easier—get hold of one of our regional managers (or Dick Nemerson 301/823-1600, 300 East Joppa Road, Baltimore, Maryland 21204). We'll gladly send one of our comprehensive Handbooks by return mail.

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Used Equipment Mart Called Best Bet for IBM Gear

By Mal Stiefel

Special to Computerworld

BOSTON – The used equipment market is the first place to look for IBM systems, peripherals and components, according to Gordon McAdams, DP operations vice-president for Investment Companies Services Corp., the DP subsidiary of Keystone Custodian Funds.

In a recent interview here, McAdams detailed some of his other observations as buyer and seller of used hardware, including:

- It is best to go through a broker rather than trying to deal with private parties directly.
- There's no need to pay full price from IBM if lower prices are available in the market.
- Some IBM deals on 370s can be more attractive than others because of shorter terms and more flexible leases.
- Brokers usually get about 5% commission on a sale.
- Some brokers are reliable; others aren't. The only way to find out is to try to do business with them.
- Inspect equipment, look at incident reports and get a certification letter from IBM regarding maintenance before any deal is closed.
- Get written quotes from brokers after sending them specifications; don't just make oral deals.

Keystone got its current 384K-byte 370/145 in the used equipment market along with earlier 360/40 (sold some time ago) and some add-on core memory for a 360/50.

The 360/50, bought from IBM, was sold through the used equipment brokers, as well as a 1410 system and several peripherals.

The company stayed with IBM in the 360 time period in the belief its hardware would maintain its value longer than that of the plug-compatible vendors.

But after equipment has been around awhile, McAdams said, users' needs change, so deals begin to appear. And it makes no sense, he went on, to pay full price from IBM if used equipment is available that can be acquired cheaper but still be maintained by IBM.

Why Brokers?

Why brokers instead of third-party leasing companies? Keystone has found dealers are invariably less flexible than the brokers and are unwilling, for example, to break up a system offered for sale as a package.

In such cases, the dealer might have trouble recovering costs on the remaining hardware once part of a system (usually the most desirable part) is sold.

Why then not go to private parties which advertise equipment for sale? Keystone tried this route, but found the offered equipment didn't quite meet its needs, he said.

Rather than compromise, it's found it can get exactly what it is looking for through the brokers, he said.

The brokers know what's available, where it is and who the customers are, McAdams said. Unfortunately, sometimes a broker will be selling something he doesn't have and hasn't the foggiest idea of how or where to get it.

To illustrate the point, McAdams told about his experience purchasing core memory back in 1973.

In response to a customer requirement (the company does a limited amount of specialized service bureau work for outside clients), Keystone decided early that year to add 128K of core by June 9 to the 360/50.

Core prices were dropping steadily that year, from $70,000 in January for 128K to less than $50,000 in June. IBM was offering the same core for $170,000.

Two weeks before the deadline, McAdams received two written quotations each for $43,000. One was from a dealer, the other from a broker. Then he began pressing for one-week delivery, since the deadline was fast approaching.

The dealer started stalling for time. It turned out, McAdams learned later, that it went into the marketplace itself as soon as it found out he was a serious buyer to get the core to deliver, but there was none to be had.

So the dealer tried to back out by hiking the price, disregarding its written quotation. Finally it admitted it couldn't help him.

At the same time, the broker said the core it had was "shipped to Europe yesterday," so it would have to get IBM to take the core out of another installation to send to Keystone. That would take 90 days.

McAdams began calling brokers again as soon as the situation became clear to him. But everyone he called already knew him, since the first two vendors had contacted everyone they could think of to try to make good on their quotes.

Next he found a broker in Washington which knew of a 360 in Hartford, Conn., with extra core which dould be removed by Computer Hardware Consultants and Services, Inc., a Newton, Pa., independent company that services IBM gear, as long as a customer for the Hartford 360 could be found.

There were two customers in Michigan who were looking for 360s, but that didn't work out. Now a week remained for Keystone.

Just then, McAdams contacted New York broker Harvey Berlent, who put him in touch with Comdisco in Chicago, which had access to a computer in New Jersey with extra core. Comma Corp. of New York, another independent maintenance organization, was called in to make the switch.

Comma removed the core on Friday, installed it in Keystone's computer in Boston on Saturday morning and the company ran with it that afternoon. The final price was $46,500.

Keystone later acquired its 370/145 as part of a deal which involved a Dallas broker and a company in St. Louis which had a computer in Portland, Ore., for sale or lease.

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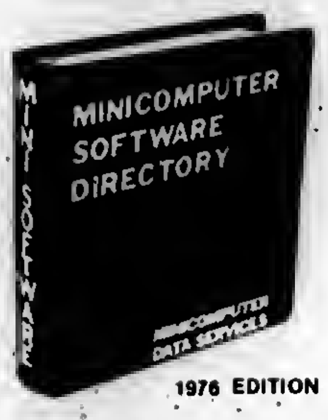

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Disks Unveiled at NCC

Peripherals Follow CPU Trend to Decreasing Costs

By Esther Surden
Of the CW Staff

NEW YORK – Mini makers, mainframers and independents alike brought disk drives to the recent National Computer Conference (NCC). The trend was toward lower cost, paralleling the decreasing cost of CPUs.

Control Data Corp. with its three disk products for minis, led the list of manufacturers introducing storage products.

The 9730 mini module drive is based on "Winchester technology" with a sealed module containing the disk spindle, recording media, rotary actuator and data recording heads, the firm said,

The unit stores 24M bytes of data and is "format- and interface-compatible" with the firm's 9760 series of OEM drives, CDC said.

The Module costs $3,020 in OEM quantities and will be available in the first quarter.

A medium-capacity, random-access storage device for OEMs, the CDC 9414 double-density fixed-disk drive provides 6M bytes and 12M bytes of data on one or two nonremovable disks.

Data is randomly accessible in an average of 65 msec; the read/write heads are positioned over the disks by a closed-loop proportional-servo system, the firm said.

Up to four drives can be operated by a single controller arranged in a daisy-chain configuration on the I/O channel, CDC said. The 6M-byte drive costs $1,695 and the 12M-byte drive costs $1,895 in OEM quantities. They will be available in the fourth quarter, CDC said.

A subsystem controlled by Intel's 8080 microprocessor was also introduced. The unit accommodates one or two floppy disk drives and was designed for incorporation into minicomputer systems.

The one-drive model costs $1,750 and the two-drive model costs $2,150 from the company in Minneapolis, Minn. 55440.

The Microdata Corp. Reflex disk drive also uses "Winchester technology" and features storage capacities ranging from 10M bytes to 50M bytes.

The unit is available in three versions with one, two or three disk platters.

The unit has a 30-msec average head-positioning time and a 6-msec track-to-track access time.

Reflex uses two heads per recording track. The drive transfers data at over 7 MHz, the firm said.

The single-disk version with 12M bytes of storage costs $2,400 while the three-disk version with 74M bytes of storage costs $3,600 and will be delivered in the first quarter.

Diablo Redesigns 44

An addition to Diablo Systems, Inc. disk drives, the 44B has the same specifications as the firm's earlier 44, but has been radically redesigned, a spokesman said.

The unit has an internal power supply; the electronics that were on 15 boards now are on five; the firm has moved to "ramp heads" and the system weighs 25 lbs less than the 44, a spokesman said.

The system costs $5,490 in single-unit quantities in comparision with $6,065 for the 44.

Diva, Inc. announced two disk drive offerings. The 50, designed for Digital Equipment Corp. PDP-11 users, features hardware compatibility and software transparency with the 50, Diva said.

The unit can hold 27.7M bytes unformatted with a 6-msec track-to-track access time, Diva said. Burst transfer rate is 806 kbyte/sec, it said.

The unit costs $13,600 with $200 monthly maintenance charge; a dual-drive version costs $19,600 with a $280/mo maintenance charge.

The DD40 series can be interfaced to the PDP-11, Data General Corp. Nova or Interdata minis, a spokesman said. It accommodates 100M bytes to 200M bytes of storage and uses the same controller on the 50.

The units range in cost from $24,000 to $28,000 from the firm at 607 Industrial Way West, Eatontown, N.J. 07724.

The 9000 Floppy disk system for minicomputers was introduced by Sykes Datatronics, Inc.

The microprocessor-based disk controller is contained on a single circuit board and performs all searching, data blocking, address verification and head loading.

The 9000 costs $2,800 for a single-drive system and $3,900 for a dual; computer interfaces cost $300, Sykes said.

An OEM Floppy System Kit consisting of a "smart" disk controller, up to four Sykes disk drives, interconnecting cable from the controller to the disk drives and a hardware interface to connect the system to microcomputers was also shown here.

The dual-density format controller writes 630K byte/diskette while an IBM-compatible format controller writes 256K byte/diskette.

The kit costs $1,398 in single quantities, Sykes said from 375 Orchard St., Rochester, N.Y. 14606.

GA Storage Modules Bow

General Automation, Inc. (GA) introduced a family of high-speed random-access disk storage modules (DSM), which includes a high-speed formatter which controls all data input and output from 40M-, 80M-, 150M- and 300M-byte disk drives.

Each formatter can support up to eight drives and data storage can be tailored from 40M bytes to 2.4G bytes, the firm said. The formatter provides a dual-port option to allow two systems access to all eight drives concurrently, providing re-

(Continued on Page 30)

Vendors Offer Printers, Tape Drives

By a CW Staff Writer

NEW YORK – Goodies at the recent National Computer Conference (NCC) included printers, tape drives and other products to make users' lives easier.

A family of OEM horizontal-font band printers, the 9830 series from Control Data Corp. operates at speeds of from 300- to 900 line/min, the firm said.

Print bands are available with 48-, 64-, 96- or 128-character sets. The printers adjusts to the size of the character set; operators can change bands without removing the print ribbon, the firm said.

The 300- and 600 line/min modes can print at 10- or 15 char./in., and standard letter-size paper is used when printing 15 char./in.

All models use common electronic and mechanical assemblies, the same print bands, ribbons and cabinets.

In OEM quantities the 300 line/min printer costs $4,000, the 600 line/min printer $6,000 and the 900 line/min printer $9,500, the firm said from Minneapolis, Minn. 55440.

Document/Passbook Printer

The Okidata document/passbook printer can be used with small business systems, according to a company spokesman. The unit, which reads 60 line/min and 110 char./sec, prints on single-part of multipart forms or horizontal or vertical passbooks.

The unit costs $3,000 in single-unit quantities, and delivery is 60 days, the spokesman said from 111 Gaither Drive, Moorestown, N.J. 08057.

An impact page printer capable of printing Arabic, Farsi and other languages and fonts utilizing interconnect characters is available from Dataproducts. It prints at a rate of 5-1/2 page/min or 300 line/min on 8-1/2-in. forms, the firm said. Dataproducts is at 6219 DeSoto Ave., Woodland Hills, Calif.

Diablo Adds 2320

The Model 2320 bidirectional matrix printer is an addition to Diablo's Hytype II printer family, the firm said.

The unit, which uses the same covers, positioning system and packaging as other Hytype II printers, prints at 200 char./sec.

The unit features horizontal and vertical tabbing, skip over space, incremental printing, upper- and lower-case 9 by 7 font, 132-column capability and an easy-to-change cartridge ribbon, the firm said.

The unit costs $1,740 in single-unit quantities or $1,450 in 100-unit quantities, Diablo said from 24500 Industrial Blvd., Hayward, Calif. 94545.

Epson Releases Printer

A low-speed 2610 line printer from Epson America, Inc. uses a belt-impact printing method, the firm said.

Low-noise printing at 150 line/min produces 64-char. sets in an 80-column format, the firm said.

The 256-character belt contains four sets of 64 characters. An optional belt provides the same character count in two sets of 128 characters, the firm noted.

The unit costs $900 in OEM quantities, the firm said from 2990 W. Lomita Blvd., Torrance, Calif. 90505.

Wangco Offers Carousel Printer

Wangco is offering the Interdata, Inc. Carousel printer to OEMs. In large volumes the printer will sell for less than $1,100, a spokesman noted from the firm at 5404 Jandy Place, Los Angeles, Calif. 90066.

An option that provides Interdata's Carousel printer users with the ability to plot computer-produced graphics is available for $195 from the firm.

A Carousel printer with the plotting option operates at 30 char./sec; the printer's 8-bit microprocessor enables the unit to determine a plotting location with a single character, the firm said.

The option including electronics and plotting print cup costs $195.

Gould Printer/Plotter

An electrostatic printer/plotter from Gould, Inc. Instrument Systems Division has interfaces for the Digital Equipment Corp. PDP-11, 2100 Hewlett-Packard Co. and Data General Corp. Nova/Supernova systems, the firm said.

The system prints 1,600 line/min with a 64-character set and plots graphics at a maximum speed of 3.25 in./sec. Resolution is 100 dot/in. overlapped, horizontal and vertical, it noted.

The plotter with print option is $7,560;

(Continued on Page 30)

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PRIME

Array of Printers, Tape Drives on Display at NCC

(Continued from Page 29)

the plotter alone costs $7,060 from the firm at 3731 Perkins Ave., Cleveland, Ohio 44114.

The Unireel from Interdyne is designed to be a low-cost digital tape microperipheral, a spokesman said. It contains a single-reed magnetic tape package and a self-threading tape drive, he noted.

The package contains 150 feet of magnetic tape which can contain 140K bytes of data, according to the firm.

The drive threads the tape using no mechanically moving parts; the drive provides constant tape tension and dynamic control of tape motion during all modes of operation, the spokesman said.

The unit costs under $200 in quantities of 1,000; the media costs under $4 in quantity. Delivery is expected in the fall of '76, he said. Interdyne is at 14761 Califa St., Van Nuys, Calif. 91411.

The Micro Bus from Interdata is a programmable interface to the firm's 16-bit minicomputers. A maximum of four low-speed devices can be interfaced to the system through the bus which takes up a slot in the central processor.

The unit works with Interdata's 16-bit operating system and is based on Motorola's 6820 programmable interface, a company spokesman said.

The unit will make it easy for someone using microcomputers to interface with Interdata's mini, he added. No prices have been set on the unit, he noted from Oceanport, N.J.

Braemar Transport Unveiled

The CS-400 cassette tape transport system is designed for microprocessor use, according to Braemar Computer Devices, Inc.

The unit is TTL-compatible and accepts and delivers serial digital data at an 8K bit/sec rate.

The system has two-channel capability, and both tape tracks are available for data, with the active channel determined via TTL command, Braemar said. The user can write one track, switch channel, change direction and continue writing on the other track, it noted.

The system costs $350 in 1,000-unit quantities from Braemar at 11950 Twelfth Ave. South, Burnsville, Minn. 55337.

The NS-11 from National Semiconductor Corp. (NSC) is a 16K by 16-bit dynamic NMOS random-access memory (RAM) designed for use with the DEC LSI 11 microprocessor, the firm said.

The unit is based on the NSC NM5270 4K dynamic 18-pin RAM, the firm said. Each NLSI-11 card contains independent card select, timing and control circuits; addresses are jumper-selected from 0 to 32K in 4K increments, NSC said.

The memory costs $1,500 in quantities of one, a spokesman said from 2900 Semiconductor Drive, Santa Clara, Calif. 95058.

A militarized 3M Co.-type cartridge transport from Qantex Division of North Atlantic Industries, Inc. provides up to 23M bits of data storage on four tracks.

A combination of 1,600 bit/in. Ansi-compatible phase-encoded recording and 30 in./sec bidirectional tape speed allows the Model 700 to record and read at 600 byte/sec, the firm said.

The system costs $2,175 and may be purchased as a drive only, it noted.

Another Qantex offering, the Model 2710 portable digital cartridge recorder, also uses the 3M cartridge.

The recorder comes with interfaces to the PDP-11, LSI-11, Nova and the Intel 8080 microprocessor and includes power supplies, formatter and interconnecting cables, the firm said from 200 Terminal Drive, Plainview, N.Y. 11803.

Microdata's Lodestar offers 10M bytes of storage on a 3M-type data cartridge.

Prices of the system begin at $1,000 in 100-unit quantities, Microdata said from 17481 Red Hill Ave., Irvine, Calif. 92714.

PDP-11/70 Gets Add-On Memory

MINNEAPOLIS – Fabri-Tek, Inc.'s Model 7011 is an add-on core memory for the Digital Equipment Corp. PDP-11/70 system.

The memory is available in 32K-word increments with up to 1M words available. Complete electrical and physical compatibility with DEC's memory has been maintained, Fabri-Tek claimed.

A 128K memory, controller, chassis, power supply and cabling costs $18,250. Fabri-Tek is at 5901 S. County Road 18, Minneapolis, Minn. 55436.

Peripherals Follow Trend to Price Cuts

(Continued from Page 29)

dundant mass storage for distributed networks, it noted.

The units have an average access time of 30 msec, regardless of capacity, GA said, and users can select sector sizes from 8 words to 1K words.

The units range in price from $20,000 to $40,000, a spokesman said, and can be used with the firm's SPC 16/60, -65, GA 440 and GA 330 minis. Delivery is 30 days, the firm said from 1055 S. East St in Anaheim, Calif. 92805.

Persci Has All-DC Drive

Persci, Inc. introduced a dual diskette drive that the firm said is smaller in size than many single diskette drives and an "all DC" drive.

Two Model 270s with two read/write/erase head assemblies can be housed in a 19-in. rack; the diskette is IBM 3740-compatible and can accommodate 3.8M bits of data per drive, the firm said.

The disk costs $880 in 50-unit quantities.

The Model 70 all-DC diskette drive features voice coil positioning, which makes access time five to seven times faster than competitive drives, the firm claimed.

Track-to-track access time is 10 msec and average seek is 33 msec.

The drive is IBM-compatible, storing 1.9M bits of data in IBM 3740 format, Persci said. The unit costs $460 in 250-unit quantities. Persci is at 4087 Glencoe Ave., Marina del Ray, Calif. 90291.

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Kansas System an Example

Networks, Software Seen Touching Realm of Minis

By Esther Surden
Of the CW Staff

NEW YORK – Networking and software design were among the topics touched upon in a session on minis at the National Computer Conference here recently.

A network places a computer of any size where it can do the most good and then connects the nodes together, David L. Nordlund of the University of Kansas explained.

"If this is done right, the whole is greater than the sum of its parts," he said.

Nordlund gave as an example the network developed at the University of Kansas to handle the needs of the various scientific laboratories automated by the professors.

A rule of thumb, Nordlund said, is that when a professor puts a minicomputer in a lab, in a very short time the system must be expanded. Because of the money involved in this expansion, the university sought a better way to accommodate the professors' needs.

It considered connecting the laboratories with the university's mainframe, but dismissed that because the professors would have to relinquish control. On the other hand, the university felt it was losing control with the individual expansion of each system, Nordlund said.

Finally an idea for a network that would "semicentralize" activities was developed. A hub system of a Modular Computer Systems, Inc. mini was set up directly under the control of all the teachers and the various minis and microcomputers in the labs were connected to it.

The hub was then connected to a central system. Communications are facilitated via a dedicated high-speed system designed in-house, Nordlund said.

The network created a system "in which each node is contributing the ideal thing for that particular node," he said.

Device-Independent Support

Another issue examined in the session included the design of operating systems for minis. System support should be device-independent, according to Dennis M. Ritchie of Bell Laboratories.

"This is seldom achieved and is rather rare," he said.

When designing software to be device-independent, Ritchie said, it had best be done at a lower level rather than putting software on top of the operating system to make similar interfaces out of nonsimilar interfaces.

Advertisements "often brag about the number of files a system offers," he noted. "I think it is the job of an operating system to obliterate this difference between concepts."

File system designs should be developed to offer efficient random or sequential access to the same file no matter where it is located, he said.

The notion of records of files is not "a useful one," he told the group. "Records are a simulation of the 80-column punched cards," he said, and a "fixed-length record is an astonishingly inefficient way of storing records."

There are complexities involved in variable-length records as well, he noted, and it is easy to "botch this concept in some way."

Operating systems should be written in higher level languages that can be read, understood and modified to some extent, Ritchie said. Written this way, the system will be slightly larger than if it were in Assembly language, but "will be no slower," he said.

Probably the biggest savings in having the operating system written in a higher level language is that it can be very largely portable, he added.

Professional societies will have to distinguish in the future between recreational and professional computing, in the view of Robert F. Rosin of Iowa State University.

"We see amateurs using computer systems to do nothing," he said, adding this group will eventually have to be shaken out of the more serious endeavors of professional computing.

This is a function of minis becoming so inexpensive that many people with no computing background will have hands-on experience with minis, according to Robert D. Russel of the University of New Hampshire.

In fact, "the minicomputer will become, in the near future, part of all manufacturing processes," he said.

Since minis are highly visible, there is a danger their widespread use will have a "very dehumanizing effect" on workers, Russel said, by making the worker feel the decision-making power has been transferred to the computer.

The computing community must guard against this psychological problem through education, he said.

Custom Systems Controllers Designed for DG, DCC Units

MINNEAPOLIS – Custom Systems, Inc. has a line of magnetic tape controllers for Data General (DG) and Digital Computer Controls, Inc. (DCC) minis.

The controllers will operate either NRZI or PE Tape Drives built by Wangco, Pertec and other manufacturers, the firm said.

The controllers are packaged with the board and all required cabling as well as a software diagnostic. Each costs $2,500 from the firm at Suite 170, 2415 Annapolis Lane, Minneapolis, Minn. 55441.

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Software Cited as Decisive Criterion in Mini Choice

By Esther Surden

Of the CW Staff

NEW YORK – "As you are going about trying to select a minicomputer, please ignore the hardware; it all does the same job.

"It's not how many index registers I have, but how much software development is available to me," Art Gravina of Cybek Corp., a New York turnkey vendor, told an audience at the recent National Computer Conference here.

Gravina was among a group of vendors and users speaking on "Using Minis in Large and Small Businesses."

Decision criteria in choosing a system must depend on the software, Gravina said. Whoever sells the system must provide adequate support, he added.

Ideal programming languages for minicomputers are not Cobol, Fortran or RPG because these languages were designed for batch systems and do not "fit into the scheme of a large number of on-line terminals," he said.

This notion is often very difficult to sell to management, he warned.

Minicomputers can be effectively used in large organizations, he told the group, citing installations at Seagrams, General Bakeries and Citibank.

"Citibank," he noted, "has made an internal decision that it no longer wants centralization." Each department head is entrusted with making the decision about which minicomputer to buy.

An example of a minicomputer installation in a large corporation, Citibank, developed to handle the processing of New York State income tax forms was described by Bob Weber of STC Systems. A basic function of the system is to open the returns and get the money in the bank, he noted.

The configuration includes a 256K-byte Data General Nova 8/30 with 40 CRTs and 400M bytes of disk on four spindles. A 600 line/min printer is also used with the system; an Interdata minicomputer acts as a controller for the disks, Weber said.

Some problems encountered with the system came from what manufacturers call "proven hardware" but is often "dead on arrival," he said.

Also, sometimes not enough time is left for testing. "The concept of programming on the truck has got to stop," he said.

On-line systems are more complex than batch systems, he noted, and problems to be solved through the system must be well-defined before implementation. A high level of specification detail must be developed for the system.

"Working with large companies is a zoo," he told the group. Although large companies don't try to "fight for the last dollar, there is tremendous cost in just getting the contract signed."

Minicomputer users look terribly naive to a manufacturer, Victor Poor of Datapoint Corp. said.

"A new or potential user asks all the questions the media has programmed him to ask," he told the group. The features users look for and the important features may be two different things, he noted.

"The average customer is preoccupied not with files, but with languages," he said. Users should ask what kind of file system a minicomputer has, whether the system can be upgraded to a large computer without a major hardware change, what the file access methods are and whether there is compatibility between the storage media.

A file structure should be transparent to the user. "You should know the files are there, but you shouldn't have to think about them very much," he said.

Files should be capable of being stored on more than one medium such as disk, floppy disk or tape, he said, with the original character of the file maintained. This is known as being isomorphic, he added.

Files should not be any more redundant than necessary, Poor said, and users should be able to access them on the basis of content.

At the moment data communications is a complicated process for users. This should not be so – "Communications should be as transparent to the user as files are," he told the group.

"It shouldn't be necessary to dial the phone or to watch the clock to make sure to do it only at a certain time," he added.

A system should also have its own data base related to the user's needs with the capability to access other systems, he said.

"And it shouldn't be necessary to have a host computer to access the systems," he noted. In host-free networks, systems can be expanded without much problem, he noted.

The ultimate hope for a minicomputer system is for the system to have the ability to exchange data on a completely transparent basis, he said.

CA Links Peripherals To Its LSI Family

IRVINE, Calif. – A DMA I/O Distributor for interfacing peripherals to Computer Automation, Inc.'s (CA) LSI family of minicomputers has been introduced by the firm.

The distributor enables up to four peripheral devices to access memory directly, with throughput of 250K byte/sec, without CPU intervention, CA said.

This eliminates the high cost of individual direct memory access (DMA) interfaces, increases I/O throughput and reduces computer overhead, a spokesman explained.

The distributor can be used in applications involving numerous slow- and medium-speed devices with the combined throughput exceeding a system's programmed I/O or interrupt bandwidth, the firm said.

Other high-speed devices such as magnetic tape or computer-to-computer communications can be supported where higher performance is required, CA said.

Low-speed peripheral devices can take advantage of the distributor's throughput without requiring new or additional software support, it noted.

The unit costs about $900 from the firm at 18561 Von Karman, Irvine, Calif. 92713.

Correction

The turnkey minicomputer for accounting and management information applications [CW, June 7] is available from Compumatics, Inc., 327 LaSalle St., Chicago, Ill. 60604.

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COMPUTER INDUSTRY

CIA Not Comforted by Description of SBS Intentions

By Molly Upton
Of the CW Staff

NEW YORK – The fears of the Computer Industry Association (CIA) were not allayed after hearing Philip N. Wittaker, president of Satellite Business Systems (SBS), describe his firm's business plans.

After his presentation to a recent CIA meeting here, the members indicated they were still worried about the possible impact on their businesses by SBS' plans.

SBS is a partnership venture owned by the subsidiaries of three firms: IBM, Comsat General Corp. and Aetna Life Insurance.

Two of the principal reservations of the CIA regarding those plans are SBS' relation with IBM and the possible prior knowledge by IBM of interfaces to the SBS system [CW, June 14].

Upon repeated questioning by Lester Kilpatrick, president of California Computer Products, Inc., Whittaker indicated some elements within IBM will know of SBS' interface plans prior to its filings with the Federal Communications Commission (FCC) since IBM, through its subsidiary, is an owner of SBS.

Also, attendees observed, IBM will be designing and building a portion of the ground stations.

"But it is in our best interest to tell the world what the interfaces are," Whittaker said.

He repeatedly assured the group it is SBS' intention to use interfaces that are widely used and are standards within the industry.

In establishing interfaces, SBS may consult with its parents as well as other firms, either in a group such as the CIA or individually, he said.

Whittaker also tried to put to rest fears that there will be some interconnection of IBM and SBS marketing forces. Neither firm, each with its own service and sales force, will sell, promote or give discounts on the other's products, he said.

Whittaker also indicated he doubts very much if IBM intends to increase its share of SBS at any time in the future.

Targeted Customers

The customer set targeted by SBS is the top Fortune 500 firms, Whittaker said, and perhaps a few government agencies.

There will probably be fewer than 100 customers for the first five or 10 years, he said. The price advantages of SBS will become more evident in a multipoint environment, he added.

Jack Biddle, executive director of the CIA, commented that while Whittaker had "mentioned in passing" the SBS market was "only" the Fortune 500, in fact that represents 90% of the DP dollars.

Eventually, Whittaker said, he thinks value-added carriers may be customers of SBS.

He reiterated the assurances in SBS' latest filing with the FCC, which attempts to assuage FCC fears about interlocking connections with IBM by saying SBS will be operating at arms-length from the parent corporations.

However, since there is an initial funding of $55 million per partner, SBS will be consulting with its parent firms on major decisions, technical expertise, advice and counsel, he said.

"We are going to operate on an independent basis, but the parents are not

(Continued on Page 36)

Adapso Calls for Worldwide Secretariat

By Molly Upton
Of the CW Staff

HEATHROW, England – National data services associations should band together to form an international secretariat or clearinghouse to keep the industry up-to-date on related activities around the world and to prevent firms from reinventing the wheel, according to Jerome Dreyer, executive vice-president of the Association of Data Processing Service Organizations, Inc. (Adapso).

The secretariat could save money for firms needing information on operations in various countries, Dreyer told the European Computing Services Association Conference on Small Business Computers and Telecommunications held here recently.

"If we accept the principle of multinational companies playing an even larger part in the world's economy, we in the computer services industry must be in the position of serving that key market. To succeed, in some part, will call for sophisticated data communications networks," he said.

Dreyer cited the need for more conformity in world communications standards: "As participants, we must move toward more uniform world communications standards that will streamline rather than impede international data communications," he said.

Worldwide Data Base

With the proposed secretariat, "relevant information on each country would be stored in a data bank available to member companies," Dreyer said.

The secretariat, funded by special assessments of the membership, could eventually become self-supporting by rendering services to nonmembers, he suggested.

"The American interest in a world DP secretariat is hardly born out of a narrow viewpoint," Dreyer said. "It is fashioned from a very realistic understanding of what can happen when there is an absence of order.

"Conversely," he added, "we would not want a single omnipotent body ever setting world DP standards; that could lead very rapidly in eight years to the very real Orwellian 'Big Brother' of 1984."

Dreyer noted the realities the U.S. DP industry faces in dealing with state and local agencies as well as federal agencies.

As indications of the increasing facilities, Dreyer said one U.S. firm has filed with the Federal Communications Commission (FCC) to become a value-added communications network service. This could establish a trend among other companies to become common carriers, he observed.

Another firm has requested FCC permission to provide packet-switching data communications service between the U.S. and the UK, he noted.

Dreyer also reviewed several areas of international scope in which Adapso is actively engaged. These include the area of electronic funds transfer systems which, he said, "is a key, in some ways, to many of the future national and international issues we as an industry will have to resolve.

"The so-called little black box, which could change financial and banking transactions, also has bearing on some other issues such as security and privacy, data and telecommunications," he said.

The two fastest growing areas of the services industry, software products and network information, are also those for which there is demand in the international realm, Dreyer said.

While revenues of the U.S. services industry are projected to grow from more than $4 billion in 1975 to $6.5 billion in 1980, network information should increase at 18% annually while software products' growth is projected at 26%. Traditional batch and contract software programming will grow at 8%, he said.

Analyst Says SBS Could Capture $1 Billion in Revenues by '90

NEW YORK – With a projected slice of the huge and quickly growing communications market, Satellite Business Systems (SBS) could reach $1 billion in revenues by 1990, according to Harry Edelson, senior computer industry analyst with Drexel Burham Co.

No company has shown such an increase in revenues within 10 or 11 years of its founding, he told a recent meeting of the Computer Industry Association (CIA).

SBS has a chance to be the biggest success at increasing revenues in history, he remarked.

IBM, he added, will accrue benefits from the SBS offshoot through its interest in SBS and also as a supplier of at least half the value of the earth stations used by SBS.

IBM's venture in the satellite business is motivated by a look at the long range, he said. IBM is entering the communications industry to protect DP, which is married to communications, he said. Any DP firm must get into communications, he added.

The communications market, he observed, is much larger than the DP market. For instance, projections call for the communications industry, with revenues of around $95 billion, to be far bigger than DP by 1985.

And the communications supply industry, he said, ranks at $14 billion currently with growth projected to $50 billion by 1985, he said.

AT&T currently dwarfs IBM by almost any means of comparison, Edelson said. Bell has five times the fixed assets of IBM, three to four times as many employees and twice the revenues and net income, he observed.

Could Lower Phone Rates

Edelson feels SBS has great potential to lower telephone rates, thereby providing inexpensive communications. This means an increase in hardware, especially in distributed processing situations, he said.

Turning this attention to AT&T, Edelson observed the firm is taking an increasingly aggressive stance with the Federal Communications Commission (FCC) and seems, with its newer models of the Dataspeed 40, to be pushing one step at a time to see where the FCC will draw the line between computer and communications devices.

A 1956 consent decree holds that AT&T should restrict itself to the communications business and not participate in the DP business.

Right now the line is drawn between the Dataspeed 40 Model 3 and Model 4, but it is a fuzzy line, he said, adding he doubts if most of the CIA members know where the line is.

AT&T is increasing its competitiveness in the data area through other acts as well, such as its one-minute telephone

(Continued on Page 35)

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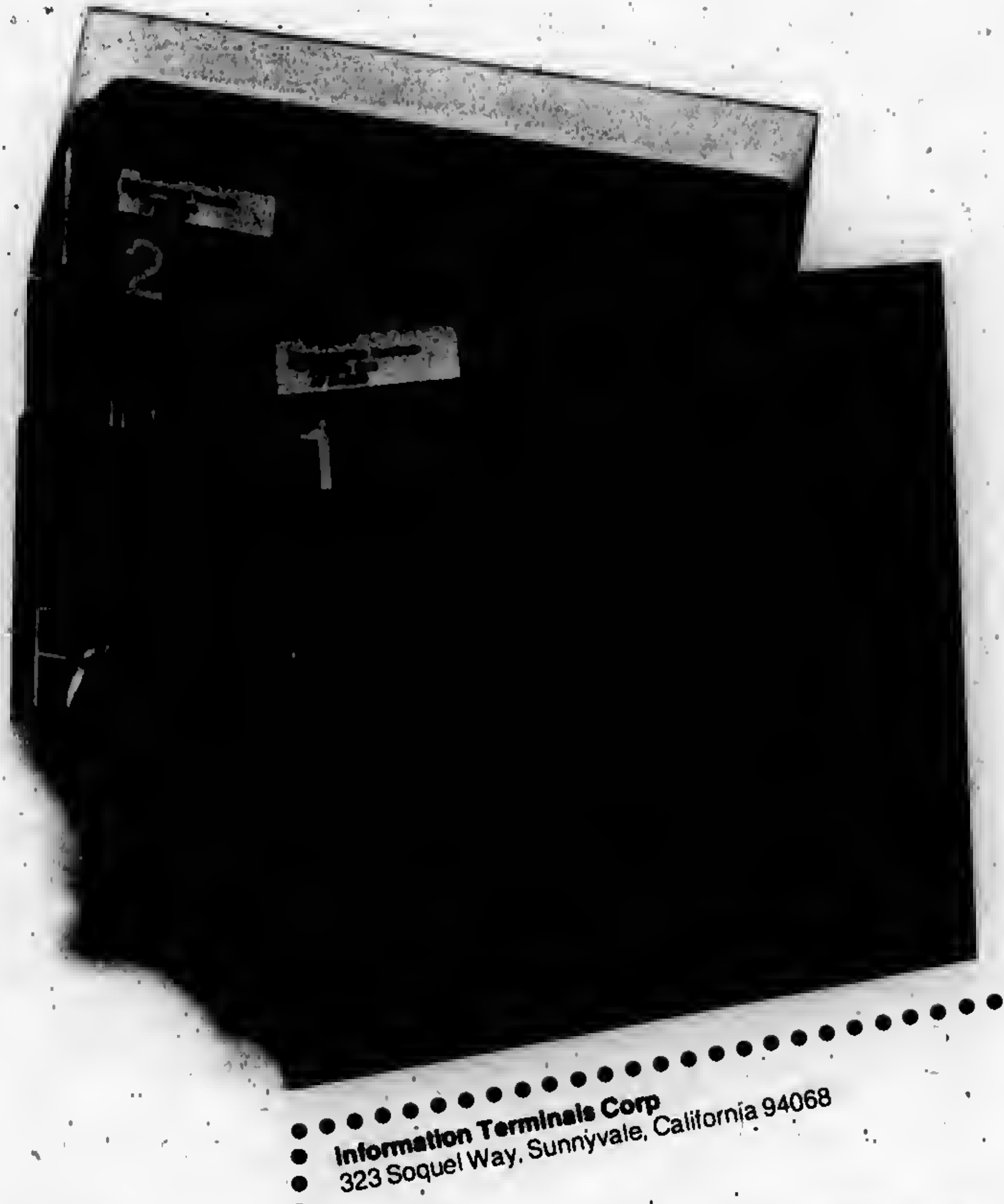

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Two Seen as Financial Drain

NCC Exhibitors Applaud Concept of One Major Show

By Molly Upton
And Toni Wiseman
Of the CW Staff

NEW YORK – Nearly all of the exhibitors polled at the National Computer Conference (NCC) here liked the idea of one show a year rather than two.

Most indicated their reasons were that the drain on company resources would be too much and that two shows a year would dilute the concept of a major show.

In addition, several said in the CW survey they feel the rate of technological advance is not sufficient to warrant two shows a year.

A couple of respondents called for a show of three days' duration rather than four.

"I would much rather have one show than two," Tom Zmach, national sales manager for Anderson-Jacobson, Inc., said.

"I was in Atlantic City for three Joint Computer Conferences and by the third year the attendance was beginning to peter out. So I think having one big show a year as a focal point is the right idea, otherwise you won't get the attendance you want."

Zmach also observed that attending shows is expensive for the company and he would rather have an impressive 20-foot booth at one show than 10-foot booths at two.

Steven Elsner, Western region sales manager for Pertec Corp., expressed a preference for one show a year, three days long, with hours from 10 a.m. to 4 p.m., since he feels the floor is "dead" after 3 p.m.

Elsner agreed that the show is extremely expensive.. "I don't think we gain that much from them," he added.

Regional shows give the company better exposure, he said, and companies can invite the people they really want to see in each area.

"There are other ways to skin a cat than NCC," he said.

Gabe d'Annunzio of Prime Computer, Inc., when asked if he would like two shows a year, said "Absolutely not." He cited the drain on resources of a company Prime's size and said he doesn't think there are enough new products in the industry to warrant two shows a year.

The crowds were good at New York, he said, but the costs were high.

A single major show has a focus that is appropriate, according to Bill Steinmetz of Four-Phase Systems, Inc. It would be somewhat detracting to have two major shows, he said.

A spokesman for General Automation, Inc. also said "absolutely not." There isn't enough time or money to support them, he said. estimating sizable booths at NCC would incur costs of about $100,000 when all the bills are in.

Two Shows 'an Overkill'

Tom Casalegno, group marketing communications manager for Hewlett-Packard Co., said he doesn't see any need for two such shows. "There are other markets we exhibit in that make sense also," he said, adding that two shows of this size a year "would be an overkill."

Gary Brunner, advertising manager for Harris Corp., said there might be a viability to two shows if the show attendance were between 40,000 and 50,000 in one show.

Don Cadieux, national sales manager of Computer Devices, Inc. said two shows a year would dilute the show.

Bob Schwartz of Amplex Corp. also said no to the idea of two shows a year, because, for the industry as a whole, one show a year is enough, he said.

Also, target dates for engineering tend to be set around a major show date, and two a year would interfere, he said.

"Two shows would have no purpose. If you're going to do it, you might as well do it big, in one centralized show," according to Bob Budenstein, director of marketing for Paradyne Corp.

"And a national show like this one, where a majority of exhibitors have concentrated their efforts, gives the public a good composite picture of what the in-

(Continued on Page 37)

$1 Billion Revenues Possibility for SBS

(Continued from Page 33)

rate, reduction of long lines rates and its backing of the Consumer Communications Reform Act, which Edelson termed a "pretty astounding" piece of legislation.

The one-minute telephone rate is really a data rate, in competition with the specialized carriers, he said.

The reduced long distance rates, whereby it is less expensive to call California than New Jersey from New York City, was a move in opposition to rates possible with satellites, which are distance-insensitive, he said.

At one point, Edelson said, he gave the Consumer Communications Reform Act a 50-50 chance of passing. But now, there are not enough days left in session for it to be passed this year, he said.

But a drawback, despite the massive effort AT&T is mounting for its passage, is that the bill has so many sponsors, Edelson doubts if any single version can get more than 10 or 11 votes. There are 150 representatives backing the bill and 11 senators, he said.

The bill essentially, says competition is bad for AT&T so it should be allowed to buy up the competition, according to Edelson's interpretation.

He also observed the opponents to the bill seem to be disappearing from the scene on Capitol Hill.

One eventuality the FCC may have to face, Edelson said, is whether SBS would be in competition with AT&T if, for example, two large SBS customers decide to interconnect their lines.

Looking to other uses of the SBS system, Edelson said an IBMer has indicated the firm has a facsimile unit capable of transmitting a page in 3.5 seconds.

This capability could lead to use of facsimile to the point where the age of electronic mail is here, he said.

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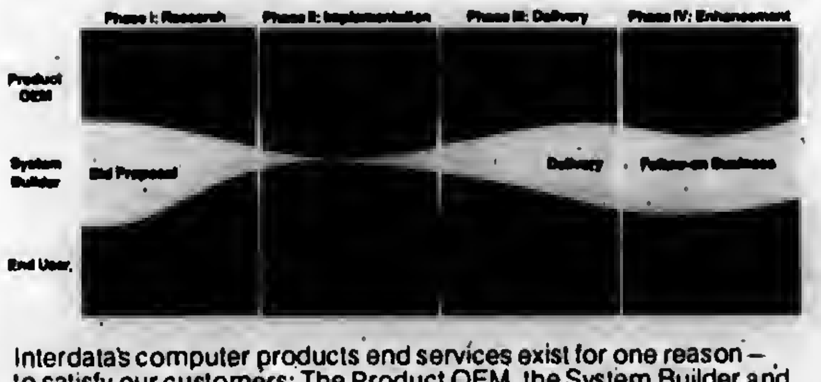

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Description of SBS Plans Fails to Assuage CIA Fears

(Continued from Page 33)

going to just throw money over the fence and not monitor the decisions we make," he said.

As an instance of its independence from IBM, one of the CIA members observed later IBM did not know Whittaker was meeting with the CIA.

IBM Motivations

When asked why IBM is entering this field, Whittaker indicated the motivation is not solely profit. Even if the profits from SBS are not substantial, IBM does have an interest in providing the capability, he said.

SBS feels the CIA and others should welcome the service it plans to offer since the speed and flexibility will offer opportunities for further expansion of the industry, he commented.

The SBS plan will also offer the capability of all-point switching including integrated voice, data and facsimile traffic, he said.

"We're not naive enough to think we can build a viable business on data alone. Our Intention is to offer major corporate customers private line systems," he said.

Whittaker commented that, perhaps optimistically, SBS has estimated it will be given the green light by the FCC by the end of the year and have the system operational by mid-1979.

Ted Schurman, manager of systems and application requirements, said the scheme will allow SBS to reduce dependency on terrestrial facilities, to provide direct access, transmit at high speed and allow for efficient use of facilities by customers.

Also, it will encourage customers to use new facilities that they may have only been vaguely considering, he said.

In addition, the scheme will offer reconfiguration flexibility, he observed.

SBS' plan is to offer a service, not a set, of parts – "no tinker toys, no pieces, but a service," he told the CIA.

Ground stations are not for sale; they will be part of the service, he added.

In order for the customer to decide how to use the facilities extended him, the SBS service will include traffic statistics, traffic priority options and network status monitoring, he added.

Schurman said he feels the SBS filing may have created a wrong impression that much processing of data will be done at the earth stations. In fact, there is a minicomputer and a large memory; the data will not normally be looked at except for compression, he said.

SBS would be delighted to meet with members of the industry either as a group or individually and describe its plans.

"We do intend to keep the industry apprised of our activity, although our designs are not completely firm," he said.

Officer Says Basic/Four Systems Aimed at Unsophisticated Users

By Esther Surden
Of the CW Staff

IRVINE, Calif. – Basic/Four Corp. systems are designed for "environments hostile to high technology," Philip Davy, vice-president and group executive for Basic/Four, said in an interview here recently.

That is, the systems are designed for technically unsophisticated users and must be transparent to them, Davy said. "A system may be kept in a 120-degree loft, and the person operating it has to know if it is dead or alive. The machine has to be able to detect errors and tell the operator what to do."

A major thrust of the company for the future will be to give the user easier ways to use the systems and with no mistakes, Davy said.

"System crashes cannot be tolerated in the first-time user environment, he continued.

"We feel our primary advantage is that we pioneered" this type of small business system and have insight into the unsophisticated user's needs.

In the past most of the firm's effort has been toward "improving what we had – making it easier to program, less costly to program, more foolproof to operate." This will continue for the future as will providing more performance for the same price, he said.

The firm sells to the end user and guides the user to sources of application programs. All software is run on a Basic/Four system in the sales office before the system is installed at the customer's office, he said, to ensure that it runs well.

The firm anticipates some enhancements to the present product line in the future because "as our customers grow we don't want them to move up" to some other company, Davy said. However, the firm will clearly remain within the limitations of the unsophisticated user market, he added.

HP Head Advocates Free World Market

SAN FRANCISCO – Hewlett-Packard Co. (HP) Chairman David Packard advocated a U.S. foreign policy designed to "minimize the barriers to free trade around the world and to strengthen the concept of a free market."

In a speech before the World Trade Club here, he said: "It is clearly too much to expect that the people in government in the U.S. or in any other country can make the balanced judgments that will provide a near optimum outcome in the complex matters of world trade anywhere nearly as well as will the forces of the free market."

In addition, the next round of negotiations with free world trading partners on the subject of tariff and nontariff barriers will in some respects be more difficult than the Kennedy round, Packard said. This is caused by the increased competitive stance of the U.S.

HP's international orders last year exceeded domestic business, he said, adding he expects international business to grow more rapidly in the future than it has in the past.

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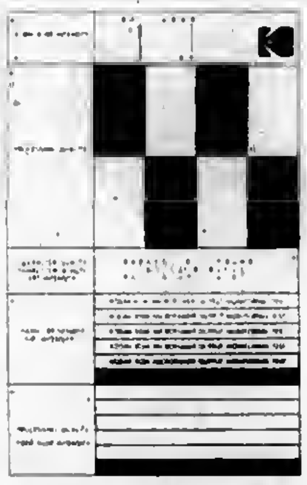

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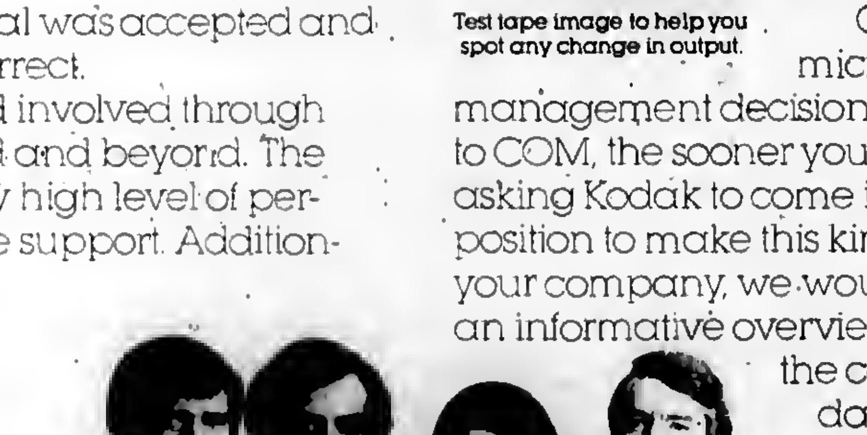

Kodak people – working together to make COM work for you.

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NCC Exhibitors Favor Concept of One Major DP Show

(Continued from Page 35)

dustry is like."

Two shows might be all right, but that means "you just about finish one and you're in the middle of preparing for another, Bill Leach, sales development manager for Datapoint Corp., observed.

About 40 companies had not been able to exhibit at NCC because booth space had been sold out, which might dictate two shows a year, Leach said.

"But, on the other hand, the problem could be solved by prohibiting really huge booths that take up so much floor space," he said.

Peter Johnson, market development manager for Basic Timesharing Corp. doesn't think business will support two shows a year.

"The combination of local exhibits such as the Computer Caravan and a major conference like NCC provides us with the best face-to-face opportunities for marketing," an Interdata spokesman said.

At the Dataproducts Corp. booth, Tom Livoti, 2290 product manager, said he would rather see one show a year, preferably outside the New York area where it is so expensive to set up.

Coping Financially

Joe Herman, manager of market promotion for data systems at Control Data Corp., said firms can't cope financially and physically with two shows a year. Two NCCs would be spread too thin, he said.

"There's also a question about being here," at NCC at all he said. But the attendees have been of good quality, he added.

But Joseph W. Gearty, marketing representative for Sycor, Inc., said he though the attendance warranted two shows. There should be a way to process more attendees, he said, since he felt some people did not come when they saw the lines down to 57th St.

It is the best of the computer shows, he said, adding he expects Sycor will need another show for future new products.

Such shows are valuable as they allow customers to become acquainted with new products, he said.

CMI to Supply CDC With CPUs

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) has signed a five-year contract to supply Control Data Corp. with its IBM 370/145-type CPU.

The agreement could be worth over $20 million to CMI, according to CMI President Joseph Kruy. The contract provides CDC with North American marketing rights for the product for five years.

CMI has design and manufacturing rights to the machine, which Kruy said is "in the 145 range."

The firm is currently in the production start-up phase and plans to deliver initial production units to CDC in the fourth quarter, he said.

Industry sources indicated the CMI machine is up and running and is program-compatible with the 145.

This is the second machine directly aiming at the IBM 370 market, following Amdahl Corp.'s 470V/6.

Executive Corner

Calcomp Picks Canova President

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) has named George M. Canova president, enabling Lester L. Kilpatrick to devote more of his time to the firm's antitrust litigation against IBM.

Canova has been executive vice-president of Calcomp for three years and was previously a founder and president of Century Data Systems, Inc., which was acquired by Calcomp.

Kilpatrick remains as chairman of the board and was elected chairman of a new executive committee of the board, which includes Canova; Walter F. Bauer, president of Informatics, Inc., and James W. Lewis, vice-president of Paine, Webber, Jackson & Curtis.

"For the past two years, I have devoted an increasing amount of time to directing the prosecution of Calcomp's antitrust suit against IBM, which is now set for trial in November of this year," Kilpatrick said.

"As a result, George has assumed more and more responsibility for the operations of the company. His election as president is formal recognition of these responsibilities. I will now be able to spend more of my time on the development and preparation of the lawsuit and on long-range corporate planning," he said.

Kruy Reassumes CMI Presidency

BEDFORD, Mass. – Joseph F. Kruy has reassumed the presidency of Cambridge Memories, Inc. (CMI) after a 1-1/2-year hiatus during which Jerry E. Goldress of Grisanti & Galef, Inc. held the position.

Goldress has resigned as a director as well, and John J. Coleman has joined the company as chairman of the operating committee.

"At the time Goldress was engaged as president, it was contemplated that his tenure would be of a temporary nature. The current realignment of the management is in keeping with those expectations," Kruy said.

Goldress was appointed in December after the firm incurred a $4.1 million loss in the year ended Aug. 31. During the recent second quarter the firm earned $54,000.

CA Cofounder to Resign

IRVINE, Calif. – Cofounder of Computer Automation, Inc. (CA), Emmons Miles, corporate vice-president and general manager of the firm's Naked Mini Division, said he intends to leave the company and the industry sometime during the next year.

Vice-President Stuart Dale has been named head of corporate product planning, and the former product planning director, Phil Kaufman, became director of engineering for the Naked Mini Division.

Brosnan Appointed Head of MSI

COSTA MESA, Calif. – MSI Data Corp. has appointed Donald F. Brosnan as president and chief operating officer. He succeeds William J. Bowers, who was named chairman of the board, and will continue as chief executive officer.

Frank A. Grisanti of Grisanti & Galef, Inc., formerly chairman of the board, will continue as a board member and has been named chairman of the executive committee.

Ball Named to Post at HIS-Canada

WALTHAM, Mass. – Richard J. Ball has been named vice-president and general manager of Honeywell Information Systems (HIS) – Canada, succeeding Donald F. Brosnan.

Peter J. Sheridan was promoted to director of marketing operations, succeeding Ball.

Other Moves

- John A. Pittman has been named vice-president of marketing and field operations for Storage Technology Corp.
- Kenneth C. Brindle has been named vice-president of marketing for International Computer Negotiations, Inc.
- Verdun Place has been appointed vice-president of Tri-Data Corp.
- Roger M. Fisher has joined General Computer/Systems, Inc. as vice-president of marketing.
- Donald R. Stroben, formerly acting president and chief executive of Computer Machinery Corp., has been named to Pertec Corp.'s board of directors.
- Intertel, Inc. has appointed Harry S. Frandsen vice-president of finance.
- Stuart F. Silloway has been named a director of Data 100 Corp.
- William V. Schellinger has been named president of Program Products, Inc.
- Charles A. Steinberg was named vice-president of audio-video systems and data products at Ampex Corp.
- David M. Baker has been named vice-president of marketing at Magnetic Controls Co.

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FASB Modifying Draft on Leasing

STAMFORD, Conn. – The Financial Accounting Standards Board (FASB) said a number of modifications are being made to the exposure draft on accounting for leases.

All interested parties will have an opportunity to comment on the proposed changes prior to the issuance of a final statement later this year.

In formulating the modifications to be incorporated into the second exposure draft, the board has given careful consideration to 240 letters of comment it received, the spokesman said.

It has also had the benefit of a critique of the changes under consideration from the members of the former task force on accounting for leases, he added.

Adapso Sets Workshop on Mailings

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) is sponsoring a direct mail workshop on Tuesday, July 13, at the Ramada Inn in Rochelle Park, N.J.

Topics Covered

The one-day workshop, in cooperation with the Direct Mail Marketing Association, will address such topics related to the computer services industry as postal and mailing regulations, how to develop and execute a direct mail campaign and how to coordinate the direct mail program with other parts of the total corporate advertising and sales/marketing program.

Cost to Adapso members is $85 and $125 for nonmembers. Adapso is at 210 Summit Ave., Montvale, N.J. 07645.

Correction

The Tally T1000 120 char./sec printer [CW, June 7] is manufactured in Italy under a license with Honeywell. Tally does not have a license to manufacture printers with General Electric.

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DIRECTOR OF COMPUTER SERVICES – Responsible for management (as well as the nuts and bolts operation) of Computer Services, including acct. management, personnel, planning, liaison with local & network committees, & maintenance of multiplexed communication. Computer Center has Harris COPE-1200 batch processing terminal with RJE access to IBM 370/158 OS-VS2 system & CDC-6600, & time-sharing access to DEC system-10 & CDC-6600. B.A./B.S., 3 yrs. exp. with computer operations, budget preparation, operational mgmt. is required. M.S. (in Computer Science or related field) or M.B.A. preferred. Sal. range: $15,500 - $17,000 for 12 months. On or before August 1. Send resume, references no later than July 6 to: Ms. Norma O. Goodwin, Personnel Admin., Indiana Univ. Southeast, 4201 Grant Line Road, New Albany, IN. 47150. Located in Louisville (KY.) Metropolitan Area. Indiana University is an Equal Opp./Affirm. Action Employer. All applicants will be considered without regard to race, sex, religion, national origin, age or handicap.

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Trade association seeks technical specialist with expertise and background in the business communications industry with emphasis on business forms and their related use in the computer field. The position requires a knowledge of product and hardware capabilities and a practical approach to the marketing significance of technical developments. Technical writing abilities necessary. Send resume and salary history to:

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Minimum qualifications: B.S. in Computer Science, Mathematics, or Physics: Experience in computer programming essential; emphasis on numerical applications and acquaintance with physics, chemistry, and cloud physics desirable. Salary: around $10,000. Dates: 1 Sept. 1976-31 Aug. 1977 (negotiable). Reply by 16 Aug. 1976 to J.L. Kassner, Jr., Cloud Physics Research Center, Univ. of MO-Rolla, Rolla, MO, 65401. *THE UNIV. OF MO IS AN EQUAL OPPORTUNITY EMPLOYER.*

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position announcements

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PACER Systems, located in Arlington, Virginia has openings for Systems Analysts. Desired backgrounds include: simulation and gaming, system design, operating systems, real-time computation, and graphics. PACER Systems has an excellent company paid benefits package and provides an attractive work environment in the Crystal City complex. Resume and salary requirements to:

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THE DEPARTMENT OF SYSTEMS ANALYSIS, Miami University, has a one-year position for a visiting assistant professor (with the possibility of the position becoming a tenured track position after one year). Candidates should have a broad applied computer science background and interest. Ph.D. preferred. Application to: Lawrance J. Prince, Chairman, Systems Analysis, Oxford, Ohio 45056. Miami University is an equal opportunity employer.

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College of Business, EASTERN KENTUCKY UNIVERSITY seeks faculty member in EDP/MIS. Rank and salary depend on academic training, professional certification, and experience. Appropriate Ph.D. or DBA preferred but will consider Master's plus experience if definite plan for obtaining doctorate. Overall enrollment 13,430. Contract begins August 15, 1976. Forward resume' to Dean, College of Business, EASTERN KENTUCKY UNIVERSITY, Richmond, KY 40475. Eastern Kentucky University is an Affirmative Action/Equal Opportunity Employer.

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RPI is a technological university of 5,000 students offering undergraduate and graduate degrees in architecture, engineering, humanities, management, and science. The person in this position will work with talented students and an interested faculty.

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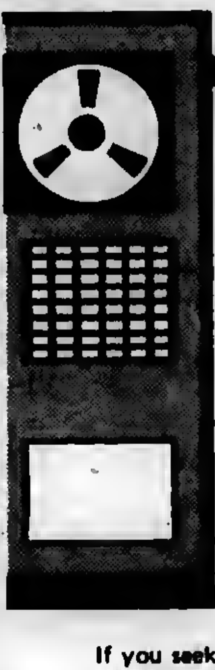

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Center for Information Processing
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Encina Commons 124
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System support position available at our general offices in Minneapolis. Work experience with IMS internal code, DBD/PSB gen or MFS required. Data dictionary experience helpful. Starting salary based on applicable experience. Excellent fringe benefits including air travel. Send resume detailing above experience to:

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Rapidly growing company needs to expand its Technical Support function with individuals who have a working experience in telecommunications network design. Should understand common carrier services, leased and switched lines, minimum cost concepts plus the various hardware/software functions available.

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Send resume in strict confidence To: AMCA International Corp., Suite 2904, 5100 Poplar, Memphis, Tenn. 38137.

Position openings: Professor of Data Processing and Computer User Services Coordinator. Both Positions require minimum Bachelors Degree and one — two years experience and a knowledge of data communications, time sharing, file organization, concepts, BASIC FORTRAN, and COBOL. Send letters applications and resumes to Mrs. Jaen Taylor, Pinal County Community College District, Woodruff at Overfield Rd., Coolidge, Az. 85228. Phone (602) 723-4141. Application deadline July 15.

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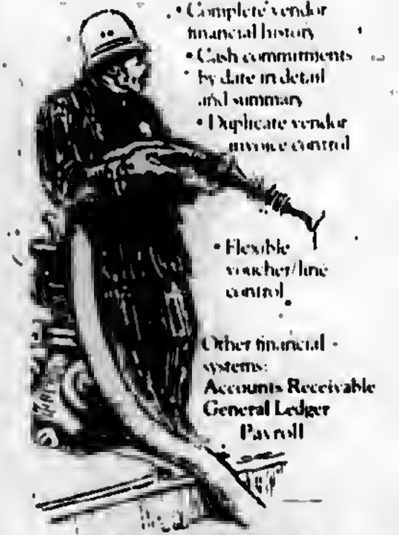

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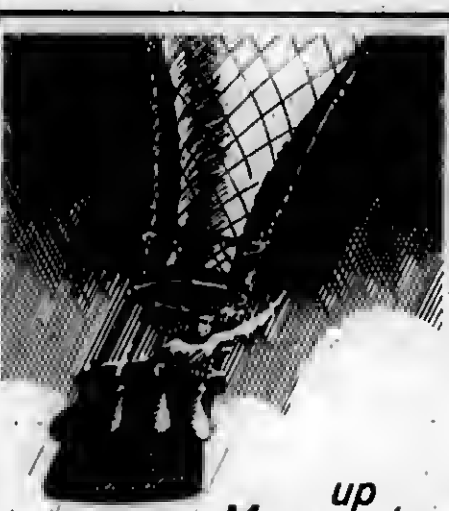

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Telex Triples Net on Small Sales Rise

TULSA, Okla. – With little increase in revenues, Telex Corp. managed to triple its income before special credits and show earnings of $6.6 million or 62 cents a share in the year ended March 31.

This compared with $1.4 million or 13 cents a share in the 1975 period.

Revenues remained nearly stable at $106.2 million compared with $106.1 million last year.

Income before special credits rose to $3.6 million compared with $1 million last year.

Although Telex Computer Products Group's revenues dipped to $78.6 million from $79.4 million last year, income before taxes turned around to $3.1 million compared with a loss of $1.3 million last year.

Telex Communications, Inc. had an excellent year, the firm said, with revenues of $27.6 million compared with $26.7 million last year. Income before taxes rose to $3.8 million compared with $2.8 million last year.

Inforex Earnings Rise Four Times Over Year-Ago Three-Month Period

BURLINGTON, Mass. – Inforex's first-quarter earnings rose more than four times to $353,000 or 12 cents a share compared with $79,000 or 3 cents a share in the year-ago period.

Income before special credits rose 10 times to $212,000 from $21,000. The special credits were $141,000 in the recent period and $58,000 in the year-ago quarter.

Revenues for the quarter ended April 2 grew to $14.9 million compared with $13.1 million in the same period last year.

Rental and service revenues jumped to $7.8 million compared with $6.7 million while sales rose to $7.1 million compared with $6.4 million in the year-ago period.

Results for the year-ago period have been restated to conform with accounting requirements for foreign currency translation gains and losses.

President Timothy C. Cronin said he was pleased with the firm's progress toward management's goals of controlling growth and improving profitability.

Lower interest expenses contributed to the improved profit margins, and further benefits were realized as costs and expenses in general were lower as a percent of revenues, the firm said.

Scan-Data Net Dives in Quarter

NORRISTOWN, Pa. – Although Scan-Data Corp's revenues rose during the first quarter, earnings plummeted to $16,528 or 1 cent a share compared with $76,133 or 4 cents a share in the same period last year.

Revenues rose to $3.3 million compared with $2.5 million in the 1975 quarter.

The disparity arose because the increase in revenues stemmed principally from field engineering services, which are not yet profitable, and from increased key entry system sales, which have a lower profit margin than the firm's optical character recognition (OCR) and mixed-media data entry systems, according to President Robert R. Burns.

In addition, lease revenues from revenue-earning equipment decreased from a year ago, although depreciation charges for this equipment have continued, he said.

Scan-Data expects to shortly begin shipments of its 2250/2 key entry system to the U.S. Marine Corps under a $4 million contract. The firm recently concluded successful benchmark testing of its software programs, it said.

AMS Scores Records In Half, Three Months

SUNNYVALE, Calif. – Advanced Memory Systems, Inc. scored record sales and earnings for the second quarter and half.

For the three months ended March 26, earnings rose to $1.4 million or 52 cents a share, including a tax credit of $651,000, compared with earnings of $439,000 or 18 cents a share in the year-ago period when there was a $210,000 credit.

Revenues for the second quarter were $9.9 million compared with $7.7 million for the same period last year.

For the six months, earnings totaled $2.5 million or 98 cents a share, including $1.2 million in tax credits, compared with $745,000 or 30 cents a share, including a $360,000 tax credit in the year-ago period.

Revenues for the six months were $19.6 million compared with $15.2 million for the first six months of fiscal 1976.

"AMS' operating performance and overall financial strength continued to improve during the second quarter," according to President Orion L. Hoch.

SEL Increases Loss In Nine-Month Period

FORT LAUDERDALE, Fla. – Despite third-quarter earnings of $158,024 or 6 cents a share, Systems Engineering Laboratories, Inc. (SEL) increased its loss for the nine months.

The earnings for the third quarter compared with a loss of $80,847 or 3 cents a share in the same period last year.

Revenues rose to $5.1 million compared with $4.2 million a year ago.

During the nine months, however, losses increased to $343,896 or 13 cents a share compared with $289,157 or 11 cents a share in the same period last year.

Revenues rose slightly to $13.7 million from $13.2 million in the year-ago period.

Tymeshare Net Up 46%

CUPERTINO, Calif. – Tymshare, Inc. reported a 46% gain in earnings on an increase of 31% in revenues for the first quarter ending March 31 over the same period last year.

Earnings rose to $1.6 million or 39 cents a share compared with $1.1 million or 29 cents a share in last year's quarter.

Revenues reached $18.4 million for the quarter, up from $14 million in the year-ago period.

Acquisitions

Comshare, Inc. has agreed to acquire Trilog Associates, Inc.'s Employee Benefits Services operation for 122,500 shares of Comshare common stock.

Trilog will become a wholly owned division of Comshare and will continue operations in Philadelphia under its current president, Donald J. Devine.

Meanwhile, **Pentamation Enterprises, Inc.**, a facilities management firm, acquired Trilog's DP facilities management services and systems engineering services operation for $643,050 in cash, based on inventory levels and certain expenses.

Tymshare, Inc. has agreed in principle to acquire Unitax, Inc. in an exchange of about 144,000 shares of Tymshare common stock with that of Unitax on a one-to-four share basis.

In another move, Tymshare has acquired the business and operations of Medical Data Systems, Inc. for 82,000 shares of Tymshare common.

E-Systems, Inc. has agreed to acquire NCR's wholly owned subsidiary, Electronic Communications, Inc. maker of communications products, for an undisclosed amount of cash.

Caesars World, Inc. has acquired 79.6% of the outstanding stock of Ontel Corp. maker of intelligent CRT systems.

Commercial Credit Corp. has completed the acquisition of Guld Insurance Unit of Wyly Corp.

Centronics Data Computer Corp. has acquired Romark Machine Co., Inc. a supplier to Centronics of precision machined parts, for 31,000 shares of Centronics common stock.

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DP Services, Inc. has acquired American Guardian Computer Service, Inc.

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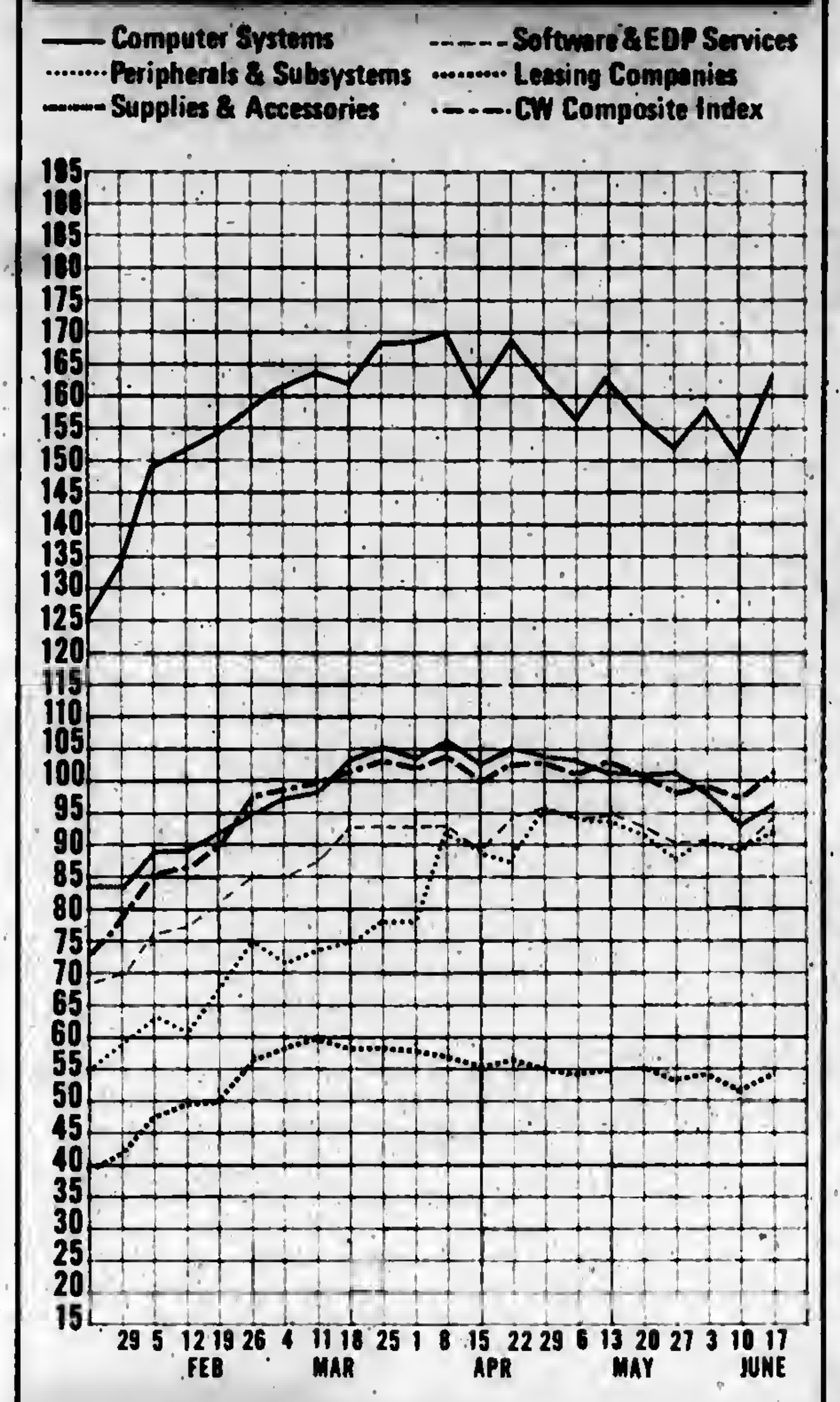

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	1976	1975
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9 Mo Shr	.72	.86
Revenue	10,215,498	8,767,780
Tax Cred	442,000	565,000
Earnings	977,618	1,164,039

CUBIC

Three Months Ended March 31

	1976	1975
Shr Ernd	$.47	$.15
Revenue	23,807,400	20,538,100
Earnings	1,034,400	340,000

DIGITAL EQUIPMENT

Three Months Ended March 27

	1976	1975
Shr Ernd	$1.53	$.95
Revenue	191,234,000	134,642,000
Earnings	18,922,000	11,329,000
9 Mo Shr	3.83	2.39
Revenue	504,293,000	373,232,000
Earnings	46,586,000	28,580,000

CALIFORNIA COMPUTER PRODUCTS

Three Months Ended March 28

	1976	1975
Shr Ernd	$.11	.....
Revenue	30,667,000	$26,210,000
Earnings	356,000	(4,618,000)
9 Mo Rev	88,817,000	90,956,000
Loss	2,736,000	3,567,000

CINCINNATI MILACRON

Three Months Ended March 31

	1978	a1975
Shr Ernd	$.41	$.79
Revenue	106,173,000	109,279,000
Earnings	1,540,000	2,911,000

a-Restated to reflect accounting change in translating foreign currency.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 16, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 16 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	99 7/8	+5 7/8	+6.2
O	COMPUTER AUTOMATION	10- 19	15	+1 1/4	+9.0
N	CONTROL DATA CORP	18- 27	22 1/4	+2 1/4	+11.2
M	DATA GENERAL CORP	40- 60	52 1/8	+3 1/2	+7.1
O	DATAPOINT CORP	24- 45	41 3/4	+5 1/2	+15.1
O	DIGITAL COMP CONTROL	2- 5	4 7/8	+1 1/8	+30.0
N	DIGITAL EQUIPMENT	138-181	164 1/4	+8 1/8	+5.2
N	ELECTRONIC ASSOC.	2- 5	3 1/8	+ 1/8	+4.1
A	ELECTRONIC ENGINEER.	7- 16	11 5/8	+1 1/8	+10.7
M	FOXBORO	28- 45	45	+4 1/2	+11.1
O	GENERAL AUTOMATION	5- 11	7 1/4	+ 1/2	+7.4
O	GPT COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	111 3/8	+6 3/4	+6.4
N	HONEYWELL INC	34- 56	47	+4 1/4	+9.9
N	IBM	227-272	262 1/2	+9 1/4	+3.6
O	MANAGEMENT ASSIST	1- 3	1 7/8	0	0.0
O	MEMOREX	18- 33	29 1/2	+5 1/2	+22.9
O	MICRODATA CORP	10- 26	21 7/8	+2 1/2	+12.9
O	MODULAR COMPUTER SYS	9- 13	13 1/4	+1 3/4	+15.2
M	NCR	24- 32	32 1/4	+1 1/2	+4.8
O	PRIME COMPUTER INC	4- 11	8 3/4	+ 1/2	+6.0
M	PERKIN-ELMER	19- 27	21 1/4	+ 3/4	+3.6
N	RAYTHEON CO	45- 60	59 7/8	+4 1/4	+7.6
N	SPERRY RAND	40- 50	48 7/8	+2 1/4	+4.8
O	SYCOR INC	20- 31	25 1/2	+1 1/2	+6.2
A	SYSTEMS ENG. LABS	6- 13	8	- 1/8	-1.5
N	VARIAN ASSOCIATES	13- 17	14	+ 5/8	+4.6
A	WANG LABS.	11- 20	12 5/8	+1	+8.6

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 16 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	6	+ 3/4	+14.2
A	COMMERCE GROUP CORP	2- 3	2 3/4	+ 3/8	+15.7
A	COMPUTER INVSTRS GRP	1- 3	2	+ 1/8	+6.6
M	CATRONIC RENTAL	1- 1	1 1/4	+ 1/8	+11.1
A	DCL INC	1- 1	3/4	0	0.0
M	DPF INC	5- 7	6 1/8	+ 1/2	+8.8
A	GREYHOUND COMPUTER	3- 8	7 1/8	+ 1/8	+1.7
M	ITEL	6- 13	11 1/4	+ 1/4	+2.2
M	LEASCO CORP	6- 14	11 5/8	+ 5/8	+5.6
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	- 1/8	-25.0
A	PIONEER TEX CORP	6- 9	6 7/8	- 3/8	-5.1
M	U.S. LEASING	7- 12	9 1/2	+ 3/4	+8.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

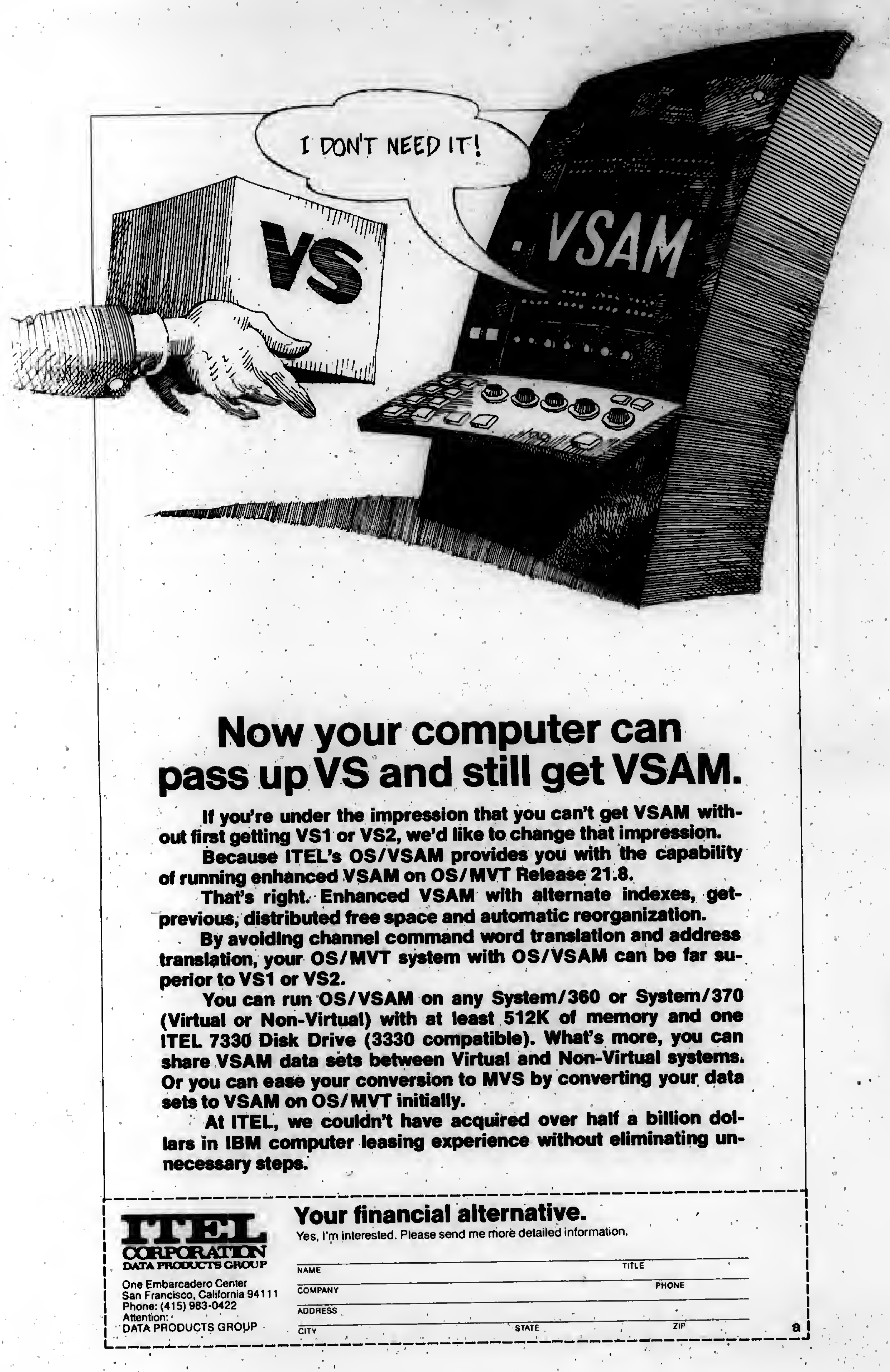
EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 16 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 5/8	+ 3/8	+30.0
O	ANACOMP INC	9- 11	8 3/4	- 1/4	-2.7
A	APPLIED DATA RES.	2- 3	2 3/4	+ 1/8	+4.7
M	AUTOMATIC DATA PROC	54- 69	68	+2	+3.0
O	COLEMAN AMERICAN COS	4- 6	3 1/2	0	0.0
O	COMPUTER DIMENSIONS	3- 7	4 3/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	7 1/2	- 3/4	-9.0
O	COMPUTER HORIZONS	1- 2	1 1/2	+ 3/4	+100.0
O	COMPUTER NETWORK	2- 6	3 5/8	- 3/8	-9.3
M	COMPUTER SCIENCES	4- 8	6 1/8	+ 1/4	+4.2
O	COMPUTER TASK GROUP	1- 1	1 3/8	0	0.0
O	COMPUTER USAGE	3- 6	3 5/8	- 1/4	-6.4
O	COMSHARE	2- 9	8 3/4	+1	+12.9
O	DATA DIMENSIONS INC	2- 4	3 3/4	+ 1/2	+15.3
O	DATATAB	1- 1	1	0	0.0
M	ELECTRONIC DATA SYS.	12- 16	13 5/8	+1 3/4	+14.7
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 7/8	- 3/8	-16.6
O	IPS COMPUTER MARKET.	1- 2	1 1/8	+ 1/8	+12.5
O	KEANE ASSOCIATES	2- 4	3	0	0.0
O	KEYDATA CORP	3- 5	2 5/8	0	0.0
O	LOGICON	4- 4	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/8	- 1/8	-5.5
A	NATIONAL CSS INC	13- 25	19 7/8	+1 3/8	+7.4
A	ON LINE SYSTEMS INC	18- 22	18 1/4	+ 3/8	+2.0
N	PLANNING RESEARCH	3- 5	3 1/4	0	0.0
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	2 3/4	+ 1/8	+4.7
O	REYNOLDS & REYNOLD	13- 21	17 1/2	+ 1/2	+2.9
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	19- 28	25 1/8	+1 5/8	+6.9
A	URS SYSTEMS	3- 5	3 3/4	- 1/8	-3.2
N	WYLY CORP	3- 7	3	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 16 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 1/4	+ 1/2	+5.7
O	ADVANCED MEMORY SYS	4- 10	8 1/4	+1 1/4	+17.8
N	AMPEX CORP	5- 8	7 5/8	+ 3/8	+5.1
O	ANDERSON JACOBSON	2- 4	2 3/4	- 1/4	-8.3
O	APPLIED DIG DATA SYS	13- 25	24	+ 1/2	+2.1
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/2	+1	+13.3
A	BOLT,BERANEK & NEW	7- 10	8 5/8	+ 3/8	+4.5
N	BUNKER-RAMO	5- 7	7 1/4	+1 3/8	+23.4
A	CALCOMP	4- 7	4 1/2	0	0.0
O	CAMBRIDGE MEMORIES	2- 6	2 1/2	- 5/8	-20.0
N	CENTRONICS DATA COMP	20- 36	32	+2 1/8	+7.1
O	CODEX CORP	22- 42	34 1/2	+4 1/2	+15.0
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 1/2	- 1/8	-3.4
O	COMPUTER CONSOLES	4- 7	6 1/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 3/4	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	1 1/4	+ 1/8	+11.1
O	COMTEN	4- 9	7	+ 3/4	+12.0
N	CONRAC CORP	20- 25	23 1/8	+2 5/8	+12.8
O	DATA ACCESS SYSTEMS	1- 4	3 1/2	0	0.0
O	DATA 100	7- 13	9 5/8	- 1/4	-2.5
A	DATA PRODUCTS CORP	5- 11	9 3/4	+ 1/2	+5.4
O	DATA TECHNOLOGY	1- 2	1 7/8	- 1/8	-8.3
O	DATUM INC	1- 2	2 1/8	0	0.0
O	DECISION DATA COMPUT	1- 4	2	+ 1/8	+6.6
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
N	ELECTRONIC M & M	1- 3	2 3/8	0	0.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/4	+ 1/2	+5.4
N	HARRIS CORP	34- 48	46 1/4	+1 3/4	+3.9
A	INCOTERM CORP	9- 20	11 5/8	+1 3/4	+17.7
O	INFOREX INC	3- 7	4	- 3/8	-8.5
O	INFORMATION INTL INC	10- 18	14 1/8	+ 1/2	+3.6
O	INTEL CORP	63-109	67	+1	+1.5
A	LUNDY ELECTRONICS	4- 7	3 7/8	0	0.0
O	MSI DATA CORP	3- 7	6	+ 1/2	+9.0
A	MILGO ELECTRONICS	15- 21	20 3/8	+ 7/8	+4.4
N	MOHAWK DATA SCI	3- 7	6 7/8	+ 5/8	+10.0
O	PENRIL CORP	1- 3	1 7/8	- 1/4	-11.7
A	REPTEC CORP	3- 8	5 1/4	+ 1/4	+5.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTOR CORP	4- 5	4	0	0.0
O	RECOGNITION EQUIP	6- 11	8 1/4	+ 1/4	+3.1
N	SANDERS ASSOCIATES	6- 11	9 3/8	+ 5/8	+7.1
O	SCAN DATA	2- 4	2 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	11 1/8	+ 3/8	+3.4
O	T BAR INC	5- 10	5 1/8	+ 1/4	+5.1
O	TALLY CORP.	4- 6	5 1/4	+ 1/8	+2.4
O	TEC INC	3- 5	3 3/4	0	0.0
N	TEKTRONIX INC	45- 63	57 3/8	+1 3/8	+2.4
N	TELEX	2- 5	3 5/8	+ 1/8	+3.5
O	WANGCO INC	11- 22	18 1/8	+ 1/8	+0.6
O	WILTEK INC	2- 2	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 16 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	2 1/4	0	0.0
O	BALTIMORE BUS FORMS	4- 5	3 3/4	- 1/4	-6.2
A	BARRY WRIGHT	6- 10	7 5/8	- 3/8	-4.6
O	CYBERNATICS INC	1- 1	7/8	+ 1/8	+16.6
A	DATA DOCUMENTS	33- 42	33 1/4	+ 1/4	+0.7
O	DUPLEX PRODUCTS INC	15- 24	15	+ 1/4	+1.6
N	ENNIS BUS. FORMS	6- 8	6 7/8	+ 1/8	+1.8
O	GRAHAM MAGNETICS	8- 13	8 1/4	0	0.0
O	GRAPHIC CONTROLS	13- 19	14 1/4	+ 1/4	+1.7
N	3M COMPANY	53- 65	56 1/8	+3 5/8	+6.9
O	MOORE CORP LTD	41- 51	41 3/4	+ 1/4	+0.6
N	NASHUA CORP	11- 17	14 7/8	+ 1/8	+0.8
O	STANDARD REGISTER	16- 19	16	0	0.0
O	TAB PRODUCTS CO	5- 9	9	+1 1/4	+16.1
N	UARCO	21- 25	21	- 1/4	-1.1
O	VANIER GRAPHICS CORP	5- 8	6 1/2	+ 1/8	+1.9
A	WABASH MAGNETICS	4- 8	6 1/8	0	0.0
N	WALLACE BUS FORMS	19- 25	20	+ 1/4	+1.2



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NEWSPAPER

Insurance Companies Indicted for Data Theft

By Naney French
Of the the CW Staff

DENVER – Fifty-six insurance companies have been indicted here for illegally obtaining individuals' confidential medical records, some of them computerized.

The indictments, charging conspiracy, impersonation and theft of trade secrets, were handed down by a grand jury following an eight-month investigation, District Attorney Dale Tooley said last week.

Among those indicted were attorneys, private investigators and others who allegedly obtained records illegally and then sold them to insurance companies, according to Tooley.

"The Denver operation is the tip of the iceberg," he said, adding that most of the companies' operations are in no way limited to Colorado. Tooley declined, however, to name any of the firms involved since action is still pending and said more indictments are expected.

Practice Not New

"Taking medical records without authorization has been going on for at least 25 years," Tooley said. Insurance companies use the information "to secure lower settlements of claims."

Many unscrupulous investigators secured detailed medical records from clinics, psychiatrists' offices, general hospitals and at least one military hospital, the district attorney's investigation found. The records stored in computerized files were turned over in the form of printouts, he said.

Tactics used by these investigators to obtain such records included posing as doctors and nurses on the telephone; dressing in clerks' attire to gain entry into record rooms; writing bogus letters requesting information; and paying persons within a hospital or from another hospital to act as "source agents," he said.

Tooley was tipped off about the scheme by an attorney representing a client whose records were obtained illegally, he said.

Evidence was obtained on those indicted through use of undercover police investigators who called medical record investigators to obtain records on individuals. One record obtained in this manner was that of the district attorney's secretary.

Two hundred dollars was a typical charge for a record obtained for an insurance claims adjuster who wanted to settle quickly, Tooley said.

To illustrate how the scheme might work,

(Continued on Page 6)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.
Price: $15/year June 28, 1976 Vol. X, No. 26

IBM Adds 3/15D, Nine Models of System 32

By Esther Surden
Of the CW Staff

ATLANTA – In response to user demand for increased on-line and remote processing capabilities, IBM last week introduced its top-of-the-line 3/15, the Model 15D, and nine lower cost System 32 models.

The System 32 models were also designed for entry-level small business applications, IBM said.

Also announced were industry application programs (IAP) for distribution finance and a set of programs for medical group practice for use with the System 32.

The upgrade path between the 15C and 15D is not direct; users must recompile application programs to run them on the 15D processor, IBM said.

Third Partition

Key to the announcement of the 15D were systems and communications programming enhancements to allow a third partition in main memory compared with two available for earlier models of the 15, IBM said.

This provides the user running communications and batch or batch in both partitions with a third area for program development, additional on-line applications or communications with a 370 mainframe, a spokesman said.

Communications Control Program (CCP) improvements include the ability of users to define up to 192 active files compared with 40 available on the 15 up till now; this capability will also aid in teleprocessing applications, the firm noted.

Users can now catalog programs from a batch partition directly into a CCP library, IBM said.

File sharing under the System Control Program (SCP) has been improved to allow sharing of more disk files between partitions and updating of files from different partitions, a spokesman said. On-line library capacity has been increased to 25M bytes compared with 10M bytes on the 15C.

Another enhancement, a CCP task-chaining technique, allows a user task to be initiated by another task without operator intervention, the company said. A program product that allows sorting un-

(Continued on Page 6)

Cable Burn-Out Brings Down N.Y. CPUs

By John P. Hebert
Of the CW Staff

NEW YORK – The burn-out of an underground feeder cable in Brooklyn recently disrupted electrical service to about nine million Consolidated Edison Co. (Con Ed) subscribers here, affecting the computer centers of the American Stock Exchange and the Federal Reserve Bank of New York.

Trading on the exchange floor halted for about 19 minutes when the momentary voltage dip caused duplex front-end communications processors to go down within 20 minutes of each other, according to Sherman Lachs, site director of one of the exchange's computer installations.

The two Communications Controls, Inc. processors service communications lines which transmit data to "the world" and to two Digital Equipment Corp. PDP-11/45s, he said.

Lachs noted the PDP-11 CPUs were unaffected by the voltage dip because they can recognize the electrical fluctuation.

The exchange's system is used to drive ticker tapes and handle all the on-line price quotations from the trading floor as well as serve stock quote vendors,' Lachs explained.

"Once trading was halted, the mechanism to get it up had to be started again," Lachs explained. He did not say whether any equipment was damaged, but noted the shop is having an uninterruptible power supply (UPS) installed this month.

Six CPUs Down

Mike Blumer, chief of the General Computer Division at the Federal Reserve Bank of New York, said all six of the division's computers went down as a result of the power fluctuation.

The casualty list that day included the bank's dual IBM 370/155 CPUs, primarily used for batch processing, two Burroughs mainframes – a B6700 and a B7760 – and two Xerox Data Systems Sigma 5s, Blumer recalled.

All of the equipment came back up Immediately after the disturbance except the Burroughs B6700, which was down for 20 minutes, he said.

When Blumer called IBM about the processors going down, IBM said it was receiving telephone calls from all over Manhattan, he added.

This was the first in a series of outages last month, according to Blumer, who now keeps records on all power disturbances which affect the DP shop.

Not quite one week after the first disturbance, the bank was hit by another, more localized disturbance centered in Manhattan, he said. That one was worse than the first, dragging both Burroughs processors down for four to five hours.

The B7760 lost one processor and 60% of its memory capacity for five hours, although the system was running 35 minutes after the disturbance took it down, he said.

But the B6700 had more serious problems. It couldn't be brought up for four hours; when it did come up, it was without one module of core memory, Blumer recalled.

Generally speaking, he said, the power disturbances happen in clusters, usually in summer, although the fluctuations seldomly affect the installation.

"Every day there is at least one incident, one fluctuation," but it isn't great enough to disrupt the computers.

"The only reason we know is because a power monitor checks all the disturbances. We see [them] every day on a record the power monitor keeps," Blumer said.

(Continued on Page 3)

Former OSI Employee Convicted Of Stealing Proprietary Software

By Catherine Arnst
Of the CW Staff

ROCKVILLE, Md. – A former employee of Optimum Systems, Inc. (OSI), located here, has been convicted of stealing that firm's software program used to maintain classified data for the Federal Energy Administration (FEA).

Bertram Seidlitz was found guilty on two counts of fraud by wire for illegally accessing OSI's system by using a Texas Instruments terminal located in his Alexandria, Virginia office to obtain 18 of 21 modules of OSI Wylbur, a proprietary text-editing system, between Dec. 15, 1975 and Jan. 9, 1976.

The conviction has been obtained, but the motive remains cloudy. Seidlitz, employed by OSI last year from Jan. 1 to June 17 as deputy project director for the FEA contract, claimed he accessed the program only to prove the laxness of security regarding the FEA system.

"I did not use it, read it or write it down and, when I had it all, I was going to take it to OSI in one bundle and show [OSI] what I'd done," he said.

"In my opinion, the situation rapidly got out of hand when [OSI] went to the level of bringing in federal involvement," he added. FBI agents were used to crack the case.

The charge of a lax security system for FEA data has been made before by the General Accounting Office (GAO). In a

(Continued on Page 2)

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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1976 by Computerworld, Inc. All rights reserved.

50 cents a copy: $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zech Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

COMPUTERWORLD, INC.
Board Chairman/Publisher — Patrick J. McGovern
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ABP AIA

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160.
ac

DP Systems Affect — But Don't Benefit — The 'Ultimate User,' Non-DPer Charges

By Catherine Arnst
Of the CW Staff

NEW YORK – "Computers have done nothing to lift the burden of paperwork from individuals. In fact, computer technology has increased that burden and demoralized the individual citizen."

That remark was made by a non-DPer, Robert Ellis Smith, publisher of the *Privacy Journal*, during a recent conference here. He carried the banner for "the ultimate user – the consumer" and his battle cry was "technology to the people."

The needs of this "ultimate consumer" are rarely considered by DPers and manufacturers, which means consumers have not gotten their share of the "technological goodies" that have been developed, Smith said.

Instead, individuals spend a great deal of time on the paperwork necessary "to keep our own lives going," he said.

Personal Access Desired

What Smith would like is for individuals to have computerized access to the personal information maintained on them by computer systems. For a fee of 20 cents, one insurance company can get a record of another insurance company's experience with a policyholder within 30 minutes from the Medical Information Bureau (MIB) computer in New England, he noted, but "for me to get the same information, I must use the mails.

"There is an exchange of correspondence going on for months, a requirement that I waive my rights to sue for invasion of privacy and ultimately no assurance that I will ever see anything. After more than a year of trying, I still havn't seen anything, even though the MIB announces that it has a policy of disclosure," Smith said.

The National Crime Information Center, the Social Security Administration's computerized communications system, the Internal Revenue Service's computers and airline and railroad reservation systems were other examples Smith cited of systems used to keep tabs on the public without the public being able to use those systems for its own benefit.

"It's the organizers of people, the processors of people, who have control of computer technology. It's not the people themselves," Smith said.

The situation must be changed by demystifying the computer, he continued. This process can be accomplished by opening public computer centers and computer stores and starting newspapers oriented to non-DPers, thus fostering "the fun uses of the computer and household do-it-yourself uses."

Second, "we must open up computer data systems to the individuals who are named in them. The thrust of the Privacy Act of 1974 is as much to open up systems as it is to keep them more secure," he said.

"Just as we must take the mystery out of how the computer works, we must take the mystery out of the types of data the computer stores," he added.

Another method of opening up computers to consumers is to redirect and reduce the cost of computer/telecommunications technology so individuals can communicate quickly and cheaply, he said.

"Business and government are able to communicate more readily because of recent technological advances, but common citizens have found it more difficult and costly to communicate than a decade ago."

A bill has been introduced in Congress, H.R. 5323, which would allow the postal service to accept noncommercial messages for individuals and transmit them electronically to the addressee's post office for delivery in the next day's mail – an equivalent of the penny post card, Smith said.

Ex-Employee Charged in Theft

(Continued from Page 1)

report issued last July 15, that agency criticized the FEA's decision to award the contract to computerize classified data to OSI because the company's proposal did not meet security requirements, particularly in the area of protection against read access to the main memory, a GAO employee who worked on the report said.

There has been no official reaction from the FEA on the report; although OSI said it is changing the operating system for its twin IBM 370/168s from OS/MVT to VS2 Release 2 in order to improve security.

"But it's entirely possible that [Seidlitz] could have gotten the software package even with VS2," the GAO employee said.

OSI said there is nothing wrong with its security system and the proof of that is the fact that Seidlitz was apprehended before he took the entire program.

The unauthorized access was discovered Dec. 3 by OSI's monitoring techniques.

"The evidence showed no classified material had been stored in the OSI computer in a manner in which it could be obtained and no sensitive data or other FEA material relating to the nation's resources had been taken," according to Jerome Finney, the U.S. attorney who prosecuted the case.

Seidlitz's job at OSI put him in the position of implementing the FEA contract and he worked directly with OSI Wylbur, Moss said.

Seidlitz also heads his own computer services company, ABC Data Corp., a fact which he said was known to OSI when he was hired. The two companies are in no way competitive, he added.

During the trial, OSI officials testified Seidlitz was asked to leave the firm because he was using the computer for his own personal affairs, but he claimed that charge was "completely false" and he left of his own volition.

Stanford Asked for Information

After the indictments were handed down, Seidlitz wrote three letters to Stanford University, where the original Wylbur system was designed, asking for information on its availability, source codes and documentation.

In these letters, he expressed the desire to develop a Wylbur program for a DOS environment for his own company and asked for information on whether OSI had Wylbur and how it obtained it.

He did not identify himself as a former employee of OSI, nor did he mention the crime with which he had been charged.

The original Wylbur program was at one time available free from Stanford, but is no longer available to commercial users.

OSI Wylbur was based on Stanford's Wylbur, but OSI spent approximately $100,000 modifying it, Moss said.

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In Watch for Banned Substances

Minis Ready to Run in Olympic Drug Control Program

By Esther Surden

Of the CW Staff

MONTREAL – Minicomputer systems at a laboratory here will be working overtime this summer to assure athletes competing in the Olympic games haven't taken any banned drugs.

A drug control program carried out by the Biomolecular-Analysis Center of the University of Quebec's Institut National de la Recherche Scientifique (INRS) will process about 3,000 urine samples during the July games, according to Dr. Robert Dugal, an associate professor at INRS and director of the program.

The INRS was given the mandate to beef up its laboratory operation in 1972 in preparation for the 1976 games.

"Since the INRS was selected by the International Olympic Committee's medical commission to carry out the program, our prime concern has been to develop a sensitive system," Dugal said.

The first organized drug testing of athletes was held during the 1968 Winter Olympics at Grenoble, France, and has continued since then, Dugal said. By 1972 only 12 of the more than 2,000 urine samples tested contained banned drugs.

The laboratory uses two Hewlett-Packard (HP) 2100-based lab automation systems to control 12 gas chromatographs and two gas chromatograph/mass spectrometers (GC/MS). They will monitor 12,000 athletes from 131 countries.

Half of the chemical analysis equipment is on loan from HP for the duration of the Olympic games, the vendor said.

HP equipment was selected for the lab because at the time "there were few choices of integrated systems," Dugal said.

System Recognizes 200 Drugs

The two lab automation systems collect and evaluate real-time data generated by the 12 gas chromatographs. Gas chromatographs separate chemical compounds in a sample into identifiable components.

The systems are programmed to recognize the almost 200 kinds of prohibited drugs by comparing incoming signals with internally stored values.

All functions – from the automatic injection of samples to the final production of an analytical report – are controlled by the system. Hardware includes 32K minicomputers, data terminal, paper tape reader and system console.

When the presence of a banned drug is recognized, the sample is run on one of the two GC/MS systems for positive identification. About 10% of all samples reach this stage because the system responds to the presence of nicotine, which may hide banned drugs, Dugal explained.

The GC/MS systems also use HP minicomputers. The spectrometer portion detects which compounds are present in the sample.

Both the laboratory automation systems and the GC/MS systems have identical disk-resident data on known prohibited substances. That data is compared with newly acquired data for positive drug identification, he said.

"Actual biological samples, obtained from individuals known to have taken drugs, were processed to give us actual qualitative and quantitative results," Dr. Michel Bertrand, deputy director of the program, explained.

The results, stored in the system's data libraries, are used to reference the identification of drug traces in samples, he said.

"The acquisition of that data was an essential part of our preparation to bring our mass screening operation under computer control," Bertrand noted.

The screening system catches all banned drugs and any compounds related to those drugs. If an over-the-counter cold remedy contains a compound related to a banned substance, that will be caught by the system as well, he said.

The laboratory contains about $250,000 worth of computerized equipment, Dugal said.

INRS lab assistant draws sample for analysis on a mini-based GC/MS system.

Voltage Dip Brings N.Y. Systems Down

(Continued from Page 1)

The disturbances are "a great inconvenience" because all the large New York City banks are tied into one message-switching network. Even though these institutions can keep on processing because they have UPS, the Federal Reserve Bank would go down because it has no UPS, Blumer said.

A UPS is the most expensive and fullest way to go – "it's the Cadillac of electrical power systems," he said.

But the system the bank is now considering is an interruptible power supply (IPS), he said, because it "levels out the peaks and valleys." It is all the bank really needs, he added, citing the high costs of a UPS.

The first voltage dip in early May was systemwide, a Con Ed spokesman said, but added "it was over in the blink of an eye." Secondary underground cables were switched in immediately to provide service to the utility's subscribers.

When asked about Con Ed's policy on this type of thing, the spokesman said users "operate any equipment at their own risk." The Public Utilities Commission does not expect or require Con Ed to provide "perfect" service, he added.

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JCL errors have also been markedly reduced. Instead of filling out lengthy JCL cards, keypunching and waiting up to four hours to get cards into the system, the programmer just sits at a ROSCOE supported remote terminal and keys in requested information shown on the CRT display. JCL is in the system in three minutes or less. If an error is made, the programmer knows about it immediately and can correct it on the spot.

ROSCOE's direct access conversational data entry features give the [illegible] of information that is [illegible] automatically. What's more, the information goes directly to the system without stops and delays usually associated with manual data entry.

Joe Dupon, Manager of Computer Technology, credits these features with many dramatic savings in time and increases in efficiency through reduced coding and programmer keying time, reduction of manual operations, less waiting for data entry, fewer chances for error, and reduction of error correction time.

Other ADR software that Leeds & Northrup has installed includes The Librarian® and MetaCOBOL®.

The Librarian safeguards the maintenance and retrieval of application programs. MetaCOBOL was used to convert from DOS ANS Cobol to OS ANS Cobol in less than half the time Joe Dupon estimated it would take.

According to Joe Dupon, "an important point about ADR's software products – ROSCOE™, LIBRARIAN and MetaCOBOL – is that they have always worked to specifications. The program packages that have been shipped to us have had a virtual zero defect level. As a result, we have never hesitated to put them to work in our system without the lengthy trial and test procedures we normally use with other products."

For more information on what ADR software can do for you, call or write Applied Data Research, Inc., Route 206 Center, Princeton, New Jersey 08540. Phone: 609-924-9100

Photo courtesy of Leeds & Northrup

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CDC, Incoterm, NCR Products Bow

Move to Electronic Banking Visible in Vendor Unveilings

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The continuing move toward electronic banking and electronic funds transfer was clearly evident in the major product announcements made at the recent American Bankers Association (ABA) National Operations and Automation Conference here.

Control Data Corp., for example, introduced Telemoney, a nationwide communications, software and support service it expects to offer banks so they, in turn, can offer the capahilities to merchants in their areas.

Incoterm Corp. announced its Series 7700 banking terminals which, a spokesman claimed, are "human-engineered" to encourage use by bank customers. And NCR introduced its mini-based 7750 Distributive Document Processing System which it said handles "most of the work in a bank's proof, sorting and reject/reentry departments."

Initial facilities offered under CDC's Telemoney, expected to be available later this year, are credit-card authorization, a check verification or guarantee service and a limited cash-card funds transfer service.

CW At ABA

A more complete cash-card service, including local and national interchange and settlement information, is planned for late next year, CDC said.

Telemoney will provide linkages between local terminals and, eventually, both Cybernet and Service Bureau Co. data centers within CDC, various credit card systems – Bankamericard and Master Charge, for example – and check authorization services, a spokesman said.

The CPU of the bank offering Telemoney to its merchant customers may also be hooked into the system, he added.

Triple Incoterm Offering

Three elements in Incoterm's 7700 line were introduced. The AT4 Customer Transaction Facility counter-top unit, activated by a magnetic stripe card, was designed to be used for account transfers, electronic payments, balance inquiries, "most of the clerical work" for cash withdrawals and special functions, Incoterm said.

The AT8 Cash Delivery Facility was designed to operate as a rapid cashback device when used with a cluster of AT4s or as a stand-alone cash dispenser.

The AT11 is a "through-the-wall" unit that combines the capabilities of the AT4 and AT8 and is intended for 24-hour service outside the bank lobby, a spokesman said.

Incoterm Series 7700 AT4

In a typical lobby situation, the cost of an Incoterm 7700 system including several AT4s, an AT8 and related hardware would be about $7,500 per AT4 station, the vendor estimated.

Meanwhile, in its back-office setting, the NCR 7750 can control as many as eight operator workstations and a range of peripheral equipment, according to the company.

The system reads documents encoded in magnetic ink character recognition (Micr) and validates the data under user-defined software control. It can capture the good data on any of several magnetic media including tape, cassettes or disk or transmit directly to a host computer for further processing, according to NCR.

Software for the system provides user control of data validation, arithmetic processing, sorting and data capture decisions; applications software for processing consolidated cash letters and remote batch communications software for binary synchronous line protocol is also available, NCR said.

In addition to the specialized software, the mini accommodates general-purpose operations under NCR Century 101 simulation or under the Interactive Multiprogramming Operating System (Imos).

The purchase price for a one-station basic system including a 64K processor, I/O writer, two magnetic tape cassette units, the operator station and a four-pocket module is $38,435. The monthly rental is $1,115.

An eight-station system including 12 distribution pockets per station, a 128K processor, 9.8M-byte disk unit and 300 line/min printer costs $336,655 or $9,510/mo under a one-year rental agreement.

Read Encode/Capture/Proof/Sort (Recaps-I) software has an installation cost of $4,840 and a monthly license fee of $75.

Pomp and Protest Create Unusual Meeting Mood

By a CW Staff Writer

WASHINGTON, D.C. – Protest and confusion on the one hand and pomp and circumstances on the other were the contrasting moods created by the appearance of two very different groups at the American Bankers Association's (ABA) recent National Operations and Automation Conference here.

Rumors that "poor people from all over the country" were going to demonstrate turned to fact the first afternoon of the conference when several hundred men, women and children – estimates varied widely on the actual number – swarmed into the meeting areas chanting against "red-lining."

Red-lining is the practice some banks are said to employ to rule out mortgage money for homes inside certain areas of major cities, marked off traditionally on the banks' maps with red lines.

The chanting became so insistent – and long rolls of red crepe paper or tape so pervasive – that discussion leaders in the technical sessions asked their audiences to stay close to the meeting rooms "until the trouble could be taken care of."

'We Want Dewey'

The rhythmic chant, "We want Dewey now" – referring to ABA's president, J. Rex Dewey – finally got results, however. Rex Morthland, the association's past president, attorney Terrance Klasby from the ABA's government relations task force and Bruce Rider of the association's headquarters staff agreed to meet with the National Peoples Action outside the hotel.

The meeting, however, was ineffectual, according to Rider, for two reasons.

Rider and his colleagues had no authority to make any agreement with the protesters and, in any case, the commercial banks represented by ABA "really have very little to do in the home mortgage area."

Beyond that, the operations and DP personnel at this conference were generally technicians and not policymakers, he added.

Seeming to confirm Rider's assessment, one banker turned to a friend after hearing the chants and asked, apparently sincerely, "What the heck is 'red-lining' anyway?"

Well-Planned Appearance

In sharp contrast with the afternoon's unscheduled events, the association's reception that evening included the well-planned appearance of another outside group, smaller in number than the protesters but still more than a hundred strong.

Three-quarters of an hour after the reception started, the high school marching band from Damascus, Md., trooped into the hallroom in green and white uniform playing everything from piccolos to tubas and bass drums.

The four bands already in place – one in each corner of the ballroom – kept their peace as the Damascus group played a medley of four patriotic songs and then retired from the scene.

The high school band director's only regret seemed to be that he didn't have his full band since 30 or more seniors had graduated; he could muster only 110 musicians for the ABA.

In the Spirit of '76

WASHINGTON, D.C. – It was almost bound to happen.

In this grand and glorious patriotic year. At a meeting of the American Bankers Association (ABA). And especially when the customer was the Bank of America.

And so it was that Bunker Ramo took the opportunity, at the recent ABA National Operations and Automation Conference here, to present the 1,776th terminal it had built for the bank to Hugh Dougherty of the bank's staff.

But one must understand there was a little time between the day the terminal came down Bunker Ramo's production line and the day it was given to Dougherty. After all, the builder realized it couldn't be just any common ordinary terminal for such an occasion.

Mechanically there was no difference between the presentation unit and the now more than 2,000 terminals Bunker Ramo has built for the bank – unless gold-plated keys instead of the usual plastic ones count as a mechanical change.

Beyond that, however, Bunker Ramo's artists did themselves proud. They painted red and white stripes – each about an inch wide – on the back of the unit. And painted the front flag blue. Then added a circle of white stars on the blue, with Bunker Ramo's name inside the circle.

Unable to resist the final touch, the vendor christened the showpiece the "Bicenterminal."

Correction

The upper- and lower-case printing feature described in "IBM System 32 Gets Word Processing" [CW, June 14] is available for $170 on a purchase-only basis.

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SSI Program 'Almost Unadministerable': SSA Official

By John P. Hebert
Of the CW Staff

NEW YORK – The Social Security Administration's (SSA) Supplemental Security Income (SSI) program is a "sophisticated, complex and almost unadministerable system," in the words of the SSA's associate commissioner of management and administration.

Laws establishing the SSI program were passed by Congress in October 1972 and called for the program to be operational by January 1974. This left a 14-month period for the conversion of 1,350 computer programs, according to Frank D. DeGeorge.

Not only did Congress give the agency only 14 months to implement a 36-month program, but laws governing SSI payments were amended first in July 1973 and, again the following December – one month before the system went live, DeGeorge said.

The laws involved the conversion of funding about three million people from the state to federal level of responsibility, DeGeorge remarked at a recent conference here.

The SSA developed a computer and communications input system to handle the new programs and a system of about 1,350 interactive terminals located throughout the U.S. was planned to handle the increased workload.

With about 1,000 terminals up, the first "test" of the system came in January 1974, when the system went live. "There were no alternatives," he said.

Hard to Administer

Problems with the system are manifold, including eligibility determinations on an error-prone quarterly rather than monthly basis, DeGeorge said. Recipients not reporting on time, if at all, or reporting erroneous information and the fact that all people under the SSI program are paid different amounts are also major problems, he said.

"The Federal government has picked up the cost of administration" of a system serving about 4.5 million recipients to date, he noted.

The SSI check is made up of three elements: a state mandatory payment, a federal maximum payment and an optional payment made by the state beyond those amounts, DeGeorge explained.

All the people, variables and options create a divergence away from a flat-rate program, making it difficult to administer the SSI program, he added.

In addition, about 300,000 people who signed up for the program had no identifying Social Security numbers and a half million people received payments based on arbitrary decisions. The agency had to assume the worst-case situation because of a lack of information and paid these people the largest possible amount, he explained.

Meanwhile, overpayments were being made at the same time another SSA computer (there are 100 computers in the SSA) knew the recipients had already been paid, he said.

"The federal administration should make payments based only on a uniform basis; it should be a flat rate. If there is a need to pay the recipients more, let the states add the extra amount," DeGeorge said.

Bill Vaughn, a congressional aide on the Oversight Subcommittee of the House Ways and Means Committee, commented "there is an unreasonable expectation of what the computer can do."

"Dec. 31 [1973] was the date for the last welfare change, which was a few days before the system went into operation.

"There is a communications gap between laymen and the computer experts," Vaughn continued. "Computers and their capability should not be oversold."

"The present welfare system is not only serious it's scandalous," Harvey Cruver of Managerial Controls, Inc., said. "The changes that constantly have to be made are enormous, just for the eligibility rules."

Cruver said the error costs are more than $1.7 billion and the administrative costs total about $1.2 billion.

"That's scandalous. About $1 out of every $3.95 goes to administration" of the Aid to Families with Dependent Children (AFDC) program, which includes about 11.7 million recipients, he said.

Larry Dooling of AT&T suggested focusing on the error rate problem in the AFDC program.

"The errors are usually caused by caseworkers at the program offices when the recipient is there," he said, citing a 53% redundancy of information entered.

This redundancy is a case for automation, he said and Norman Davis of American Data Systems agreed.

Three areas where Davis thought automation could help out dollarwise in welfare management are in income maintenance systems; in the Medicaid Management Information System (MMIS) and its six subsystems; and in the realm of social service.

The problems with the welfare system, he said, are political. There are constant changes with the system and the agency is "just trying to keep its head above water."

Top-Secret Data Base Left for Viet Reds

CHICAGO – A prize piece of booty captured by the North Vietnamese Communists in their takeover of Saigon on April 30, 1975, was an IBM computer complete with a top-secret data base, according to a recent *Chicago Daily News* item.

The file included the names and records of more than 1 million members of the South Vietnamese armed forces, according to a serialized account of the fall of South Vietnam by Gen. Van Tien Dung, North Vietnam's top field commander.

Dung confirmed that highly classified intelligence data fell into the hands of the Communists when South Vietnam collapsed. Besides the military personnel listed in the data base, there were also files on policemen, agents, double agents and other members of the Saigon government's security apparatus.

IBM officials said they had no control over the computers which were left behind, according to the *News* report, and that there was nothing secret about the hardware since the same models are sold to the Soviet Union. Only the data was top-secret, they said.

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A "plug-in" data entry system is only one of TASK/MASTER's many advantages. Others include the ability to write on-line application programs in any language, ease of system use and maintenance, superior restart and recovery facilities, reduced storage requirements, and support for most terminal types and database management systems.

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IBM Introduces Top-of-Line 3/15, System 32 Models

(Continued from Page 1)

der CCP costs $16/mo, it noted.

The 15D can accommodate 160K, 192K, 224K or 256K bytes of main memory, the same as available for the 15C.

Disk storage has been expanded to allow accommodation of one of four possible disk configurations, the largest of which can have 506M bytes of disk. This is more than 2-1/2 times the disk available to Model 15 users previously, IBM said.

Disks can be 3340-A2, with two spindles using a removable 3348 Model 70 data module and accommodating 101.2M bytes; the 3340-A2 and 3340-B1 for three spindles with 146M bytes; the 3340-A2 plus a 3340-B2 for four spindles with 192.6M bytes; and the 3340-A2 plus a 3344-B2 for four spindles with a combined total of 506M bytes.

The 15D has a faster instruction fetch time for certain non-I/O instructions to complement the requirements of programming support, IBM said. No noticeable improvement in total throughput will be apparent to the user; also no degradation in response time should occur with the enhanced programming techniques, the firm said.

Current Model 15Cs can be upgraded in the field to the 15D, a spokesman noted. An upgrade from a Model 15C processor with 160K to a 15D with the same amount of memory would cost $7,440, he said.

The 15D will cost from $127,740 to $143,940, IBM said; rental costs are from $3,429/mo to $4,054/mo under the Monthly Availability Charge (MAC) or from $3,266/mo to $3,861/mo under the Term Availability Plan (TAP). First shipments will be in December, the firm said.

System 32 Models

The low-end models of the System 32 are intended for first-time users or users with remote applications in situations where less function may be required, IBM said.

Disk capacity has been downgraded to 3.2M bytes compared with 5M bytes for the lowest model previously available. A unidirectional printer with a 40 char./sec speed also reduces the capabilities of the system.

The System 32 A01 with the 40 char./sec unidirectional printer and 3.2M bytes of disk costs $33,560 or $680/mo on the TAP and $714/mo to rent. A middle-capacity A21 with an 80 char./sec bidirectional printer, 3.2M bytes of disk costs $34,020 or $771/mo on the TAP or $809/mo on MAC.

Disk capacity can be as high as 13.7M bytes for the A04, and printer speeds of 155 line/min are accommodated on the Model B31.

Not all IAPs can be run on the low-end System 32 models, a spokesman said.

A group of application programs for medical groups called the Medical Group Management System are designed to handle patient billing, accounts receivable, insurance claims and statistical data for practice analysis.

The user can prepare charge slips, statements, accounts receivable reports, revenue analysis, diagnostic and procedure analyses and insurance claims. The programs are available for an initial charge of $1,250 with a monthly license charge of $64 and will be available in October.

An IAP designed to improve financial controls for distributors, the Distribution Financial Accounting System (DFAS) includes three sets of programs that assist in controlling costs, paperwork and in planning general ledger, accounts payable and payroll applications, the firm said.

The general ledger module costs $405 initially with an $18 monthly license fee; the accounts payable module is $405 as well with the monthly $18 fee; and the payroll module is $515 initially and $23/mo thereafter. DFAS will be available in September.

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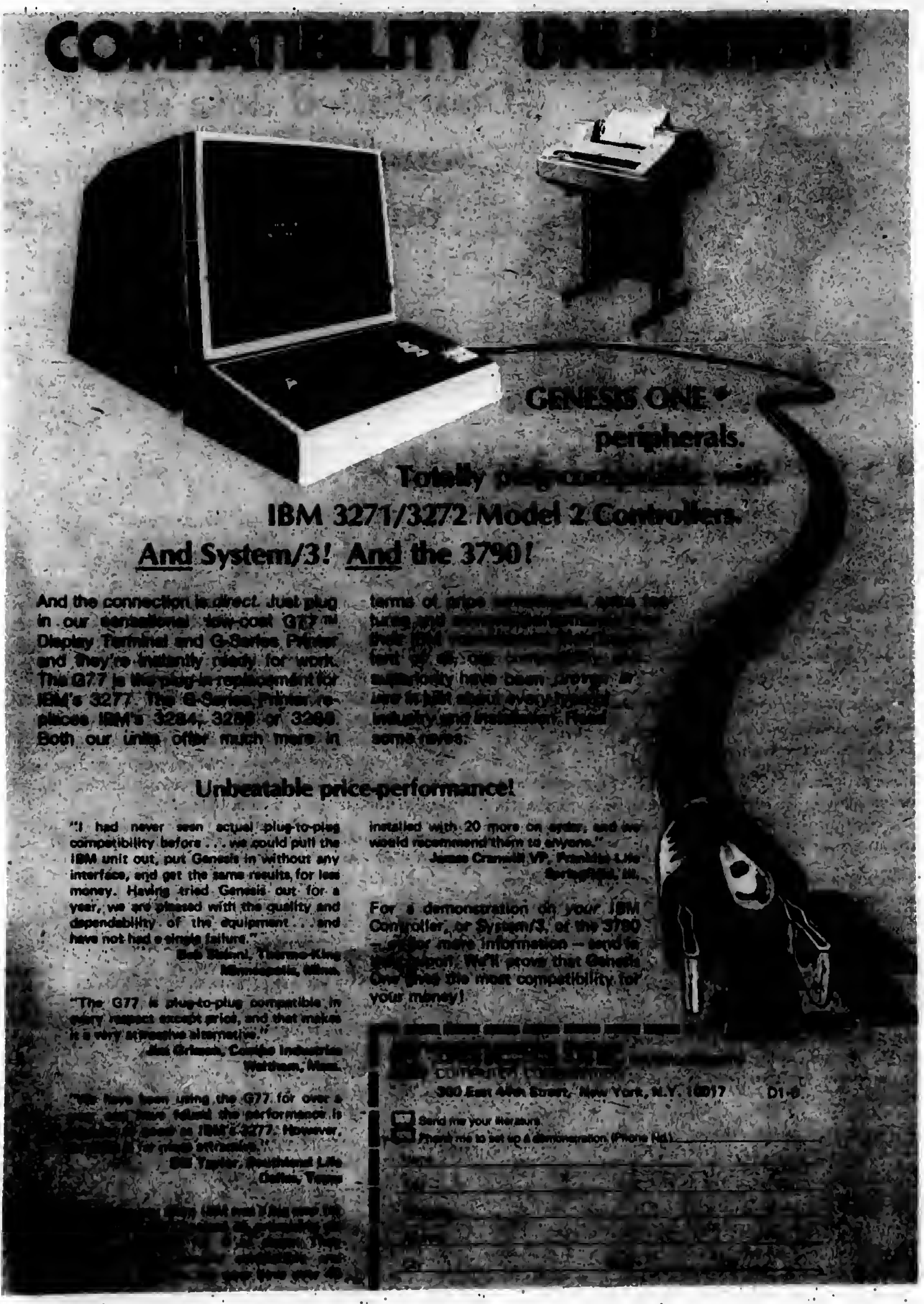
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Colo. Insurers Named In Theft of Records

(Continued from Page 1)

Tooley described a real case in which a construction worker was seriously injured on the job.

The worker filed a claim with his insurance company. The insurance company or its attorney hired one of these medical investigators to obtain the medical record illegally. Contained in that record was information about an earlier treatment for venereal disease, Tooley said.

"You can see how useful that sort of information might be in urging someone to settle his claim," Tooley said.

Jury Issues Recommendations

Along with its first round of indictments, the grand jury released a set of recommendations aimed at correcting the medical records confidentiality problem.

The first two recommendations called for strengthening the Privacy Act of 1974 to make it a felony to seize patient records where the value of medical services provided or the sale of the records themselves exceed $200.

Second, it recommended the Privacy Protection Study Commission, established by the Privacy Act, draw up a model act for states that would make disclosure of medical records a felony.

The insurance industry, through state insurance commissioners, should take strong disciplinary action against those who violate these principles. This could include voiding their right to do business where they have violated the law, the grand jury suggested.

Courts, as regulators of lawyers, should discipline attorneys who participate in these violations, it added.

The grand jury also called for tighter controls on medical records within hospitals. Records should be kept of all individuals who access a medical file and no access should be given without written authorization, the grand jury said.

Since 60% to 70% of such data is given out over the telephone, the grand jury proposed that hospitals develop a verification and callback procedure and enforce it.

Finally, "old" patient authorization forms should not be honored, the grand jury said. Recognizing this recommendation could cause some problems, the grand jury did not specify a time period beyond which authorizations should not be honored, leaving that responsibility to the insurance industry itself.

Problem-Specific Privacy Laws Seen Needed by Private Sector

By Nancy French
Of the CW Staff

NEW YORK – Congress should concentrate on laws that address specific privacy problems rather than on an omnibus privacy law for the private sector, a panel of businessmen and attorneys said at a conference here recently.

No government agency is capable of interpreting and enforcing such a law and existing laws already give consumers recourse through the courts, they said.

A privacy law that restricts consumer reporting agencies from collecting information deprives consumers of the right to have their credit history passed on to another company from which they are seeking new benefits, according to A. Lee Lester of Equifax, Inc., formerly Retail Credit Corp.

The panel disputed the commonly held belief that business seeks to block individuals from credit and other benefits through investigations that turn up only the worst information.

At a time when half the business generated by a retailer such as Montgomery Ward is done on credit, "we don't want to turn credit-worthy customers away," Richard Cremer, who handles credit policy at that company, said.

Most consumers are not concerned with privacy; they just want to know that the information is correct, Lester said.

Questions for Congress

"Congress is going to have to answer a lot of hard policy questions before enacting a bill that requires business to collect and maintain only relevant and necessary information," according to Wright Andrews of Sutherland, Asbill and Brennan, the firm defending Equifax in the suit brought against it by the Federal Trade Commission [CW, Dec. 26-Jan. 2, 1974].

"How can an agency of the government tell [members of] the diverse business community what is relevant for each of them to collect?" Andrews asked. "What does it cost to collect only relevant information?"

Further, who is to decide if information is complete? he asked.

The privacy board or "federal information czar" most federal bills establish to write regulations that implement such a law could turn into a "Big Brother," he said.

On the provision in most privacy laws that calls for consumers to be notified when their personal information is used and disseminated, Andrews asked how that is to be done and how often.

If consumers are permitted to access their files and obtain copies, he added, how can this be done without centralized data banks that would create the very dossiers that privacy advocates are fighting?

Andrews also argued that if the names of third parties who provide credit investigators with information about their neighbors are disclosed to the consumer, "those sources will dry up."

Nuisance Suits a Possibility

Referring to the Privacy Act of 1974 as "the Lawyers Relief Act," Andrews said bills proposed to date give individuals broad rights for litigation and could result in a great many nuisance suits. Even programmers would be subject to personal liability, he said.

Furthermore, he asked, who should be required to pay the lawyers' fees – the company that violates the law or the consumer who brings the suit?

As for limiting use of the Social Security number, legislators should decide what their concern actually is. Are they troubled by use of the number itself or are they worried about using the Social Security number to link files? he asked.

As for discontinuance of the Social Security number, Andrews said it would actually cause business very little trouble since it is used largely as a "secondary checkpoint" to assure the correct identify of an individual in the case of similar names.

Mailing Lists Defended

Cremer also took the opportunity to defend sale of mailing lists for direct mail advertising.

Research conducted by A.C. Nielson indicated 75% of mail recipients open and examine direct mail they receive. Fifty percent use the coupons received, and 42% consider direct mail "useful," he said.

Further, two-thirds of the firms that use mailing lists are small companies earning less than $500,000 annually and employing fewer than 100 people, he said.

Privacy Laws Protect Civil Liberties: Higgs

NEW YORK – To describe as privacy laws those laws that protect individuals from misuse of their personal information is inadequate, according to Louis D. Higgs, deputy director of the Privacy Protection Study Commission.

The national Privacy Act of 1974 and the many laws passed by the states are actually fair information practices acts that protect civil liberties far beyond the scope of mere privacy, Higgs said here recently.

Broader Threats Posed

The threat posed by misuse of personal information is far broader than mere intrusion on a person's territory, he added.

Transferring profiles of persons without their consent nullifies their ability to "maintain control of their own lives. This is an equity problem," he explained.

Secondly, the inability to control the collected information "destroys peoples' abilities to overcome previous mistakes," he said.

Further, this type of activity "erodes one's autonomy and limits one's right to choose." It makes little difference if people have the right to buy insurance or obtain a credit card, for example, "if they are afraid to exercise that right," he said.

Basic Principle

Turning his attention to some of the common themes in fair information practices laws considered to date, Higgs explained that one of the basic principles involves "what say individuals have over information that pertains to them."

Thus, the basic provision all such laws contain is access to one's own file, he said.

Higgs compared this to the right to vote – "it assures your stake in society is protected," he said.

Pointing out that America is a "transactional society," Higgs said Americans make records of those transactions upon which the service delivery system depends.

"People apply for certain services and, on the basis of those applications, decisions are made. Then people conduct those transactions, and this produces the need to collect payments. More records are produced, and then someone audits these records," he explained.

Finally, those records are "aggregated and disaggregated" in planning for new transactions.

The Privacy Protection Study Commission, now one year old, is researching all these problems and will produce its final report for Congress on June 10, 1977.

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Says Problem Yet Unrealized

Rose Cites Need for Congress to Make Policy on DP

By Nancy French
Of the CW Staff

NEW YORK – Selling Congress on the need to formulate public policy on information and computers is "like trying to pass zoning ordinances on the moon," Rep. Charles Rose said here recently.

"Not many members of Congress are even aware of the need for information policy or realize it's a problem yet," the North Carolina Democrat told a National Computer Conference plenary session on public policy and computers.

Rose was filling in for Rep. Wayne L. Hays who, he explained, was absent because of "unexpected bugs in his software.

"His hardware was also down," Rose added.

"The greatest challenge facing Congress today is making the legislature an effective overseer of the executive branch," Rose said, "and Congress is only beginning to give itself the kinds of tools it needs to do its job effectively.

"Not until Congress understands computer technology and the problems involved in that technology can we make the kind of national policy on information this country needs, and only then will Congress be an equal branch of the Federal government," he said.

Rose, who heads the House Administration Committee's Subcommittee on Computers, said he doesn't expect any reduction in the momentum of the subcommittee's activity if Hays should resign as committee chairman.

Hays, a strong supporter of the Computer Subcommittee's efforts, would probably be replaced by Rep. Frank Thompson Jr. (D.-N.J.), Rose said at a news conference following his formal presentation.

Important Steps

The 94th Congress has taken some important steps aimed at bringing computers to bear on the information explosion, and Rose hopes to do more, he said.

Creation of the House Administration Committee's Subcommittee on Computers was one, he said. A second was getting through a measure authorizing each member of Congress to spend $1,000/mo of his staff budget on computer services, including rental of terminals and time-sharing services.

"It would do your hearts good," he said, "to see your congressman carrying a portable computer terminal with an acoustic coupler built into it down to his district to bring himself up-to-date on issues over the weekend."

Using such a terminal, a member of Congress could dial a number at the Library of Congress and access information maintained on-line on the Library's Scorpio system, he said. Scorpio contains a digest of bills as well as over one million citations of articles on any number of subjects.

Rose also boosted his bill to computerize the catalog of federal grants – a list of federal programs that is presently published in a document three inches thick [CW, May 24]. A similar bill was introduced in the Senate by senators Edward Kennedy (D.-Mass.) and William V. Roth Jr. of Delaware.

About the federal grants catalog, Rose said "it takes a Philadelphia lawyer to understand it, and when he's through reading it he still doesn't know if there's any money left in any of the programs he's interested in, or even if his community is qualified for them."

The bill would require the Office of Management and Budget (OMB) to update the system regularly by line item so Congress can tell what funds have been spent, how much is still available at any given time, and whether federal agencies are complying with legislative intent in implementing their programs.

"OMB doesn't want to give up that kind of information and it's going to be a devil of a job getting [the President] to sign it," he said.

Rose said he is looking forward to the day when the Congressional Budget Office has a computerized fiscal budget system containing an inventory of money appropriated over the years. This will enable Congress to compare budget items with previous years before voting on a new budget.

Dr. Alice Rivlin, director of the Congressional Budget Office, is working on a system Rose anticipates will be operational by next January.

While Rose believes Congress should be doing more, he pointed out some information policy already on the books.

The Brooks Bill, passed in 1965 but not yet fully implemented even today, seeks to control the procurement and management of information-processing equipment in the Federal government.

The National Science and Technology Policy, Organization and Priorities Act of 1976 calls for a continuous appraisal of the role of science and technology in achieving goals.

The Copyrights and Revisions Act of 1974 authorized a National Commission on Copyrights which is studying the question of copyrighting computer programs as one part of its policy mission.

The Privacy Act of 1974 placed limits on the collection and use of personal information within the Federal government, he said, adding that misconceptions about this law unfortunately "outdistance the misconceptions about nuclear power by at least a factor of 10."

Bidding for DP Art Up

NEW YORK – Computer art at the "Dutch" or silent auction held at the National Computer Conference here recently drew bids ranging from a low of $15 to a high of $200, with many bidders paying twice the asking price.

The exhibition itself, billed as one of the largest international computer art shows to date, drew 2,000 visitors.

The works reflected the use of the computer as an intermediate device, with the final art forms reduced to fine art in varied media including etching, lithography, textile design and photography.

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Plan Scheduled for Late '78

HIS Planning Migration Option for Xerox CP-V Users

By Nancy French
Of the CW Staff

PHOENIX – Honeywell Information Systems (HIS) is working on a plan that will offer users of Xerox's CP-V operating system a migration path to an HIS system by late 1978.

The migration path will allow the CP-V user to convert to a "derivative" of HIS Series 60 level 66 system at about 30% to 35% of the effort needed to convert to another manufacturer's system, according to John Eschinger, vice-president of Exchange, the Xerox users group.

The official announcement of the plan was made at a recent Exchange meeting here by Lee E. Sheehan, vice-president and general manager of HIS' North American Computer Operations.

HIS agreed to assume responsibility for service and marketing support functions for Xerox users after Xerox announced its plans last year to leave the computer industry.

According to Eschinger, who is assistant director of academic services and computer systems at Bucknell University, the Honeywell offering is expected to be "price-compatible."

As an intermediate step, HIS will offer a microprocessor-based controller interface to allow Sigma computer users running under CP-V to attach high-speed, high-density HIS peripherals to their systems by about 1977.

The highest density disk presently available from Xerox is 100M bytes, according to Eschinger, who has been working on the Honeywell-Xerox Users' Committee to bring about the plan.

Until these HIS products are available, users will be depending on Xerox add-on memory, presently being marketed by HIS, Eschinger said. Xerox add-on memory is "a major survival issue" because the average CP-V user site has been growing at the rate of 30% a year and the average CP-V user already has 128K of memory on his system, he added.

Eschinger also predicted that mean memory size will increase to 160K bytes of 32-bit word memory by 1978, so a migration path to a bigger and more powerful system is a top priority item for the Honeywell-Xerox team to work out.

About 120 users are presently running under the Xerox CP-V operating system.

HIS expects to announce the migration plan as a definite product as soon as specified performance levels are verified and user acceptability is determined a spokesman said.

The plan has taken shape slowly because every decision has to satisfy HIS business needs as well as those of the users, Eschinger noted. "It's in our best interest that Honeywell stays profitable," he said.

The future is less clear, however, for Xerox's 275 real-time users and the few still running under BPM-BTM, the predecessor to CP-V on Sigma 5s. These users, who tend to be "more diversified," have not yet organized to articulate their needs to HIS management, Eschinger said.

Users who are running Sigma 5s cannot migrate to CP-V because they don't have memory map hardware or byte string manipulation capability, he said.

An HIS spokesman confirmed the mainframer is investigating the possibility of providing the necessary capability as a standard produce, but no decision has yet been made.

The CP-V migration plan calls for translating most of the processors that are running on the Sigma and the 500 series of the CP-V operating system. This would include APL and Fortran, he said.

"We are taking some processors from the Honeywell side of the house, including its data base management system and its Cobol, which is better than Xerox's, he said, "and obviously we're also going to require some conversion tools."

Most Xerox users greeted the HIS announcement with enthusiasm because "we have someplace to go now," Eschinger said.

However, they are not ready to embrace Honeywell's Gcos operating system "particularly because of the way it interfaces with the user," he said.

"If you create a file on-line, it's in Ascii code, whereas a file created in batch is octal," he said. Having a file system that's built in Ascii and computational system built in octal creates a certain amount of awkwardness, he explained.

Sheldon Klee and nearly 100 other former Xerox computer software development engineers have been hired to work on the project, the HIS spokesman said.

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Users Urged to Recognize Full Scope of Data Security

By Toni Wiseman
Of the CW Staff

CHICAGO – There are three important things to bear in mind when considering the protection of data, Robert Courtney, director of data security and privacy for IBM, told attendees at a Computer Protection/Insurance seminar here recently.

The first thing to realize is there is a wide variety of things which can happen to data; therefore, a broad definition of data security must be formulated, he said.

The realization that data is a major corporate asset is the second tenet, and, last but not least, the user must accept the need for a completely rational, feasible risk assessment technique, he said.

The lack of any one of these elements will result in an ineffective data security system, Courtney said.

Data security systems are intended to guard against accidental or intentional disclosure, modification or destruction of data, he said.

"If we are going to attack our data security problems in a systematic and rational way, we must prioritize our problems."

Courtney outlined the six major data security hazards, with errors and omissions topping the list.

Dishonest employees and immediate past employees are the second most important hazard, he said. "It's a fact people rip off that part of the system they know best," Courtney said. "They don't cross boundaries."

This means an employee will generally abuse that part of the system he has already been granted entry to, so access control alone will not solve the problem. Rather, the solution is to be found in individual accountability, he said.

Third on the list of hazards is fire, Courtney said.

"Relatively few fires start in computers themselves," he said, "yet managers of DP facilities have a strong tendency to put fire-detection and fire-quenching equipment where the dollars are and not where the combustibles are."

Firms have an affinity for situating their computer rooms on top of cafeterias, usually right above the stoves, or under the cafeteria below the dishwashers, Courtney said.

Fire protection is important in areas where files, tapes and power sources are located as well as in the computer room since "even if your computer is still operating, it won't do you any good if your back-up files are gone or the communications lines are down."

Disgruntled Employee

Disgruntled employees are a fourth category, separate from dishonest employees, he noted.

These people don't have an economic grudge against the company and generally want their damage noticed.

"This type of damage does not occur often, but on a per-instance basis the economic impact is quite high," Courtney said.

He typified this hazard as the kind which arises when a programmer asks for help three times on a job he can't get to run and all he gets is a pat on the back from the manager and a word of encouragement. He then goes home, gets his 38 and shoots the computer.

This type of situation usually occurs over a long period of time, however, so a reasonably aware management should be able to notice its development and take preventive measures.

Broken water pipes which overflow through the overhead ceiling tower over natural disasters in terms of frequency and cost, he said. Yet $15 worth of polyethylene film and a pair of scissors can cure the problem by covering the box under the leak.

Strangers are the final hazard category. This is someone from outside the company, he said, such as a student from a computer school on an ego trip who wants to prove to his buddies he can get into the system, create a system crash and leave a message such as: "This crash courtesy of the XYZ School of Engineering."

The economic and operational upset here is negligible, since these perpetrators don't seem capable of following through and making a dollar from their actions, he said.

If one can prioritize the hazards, then good solid quantitative risk assessment is the next step, Courtney said.

This consists of plotting on a graph all the data and physical holdings of the company against the various hazards which can impact them in terms of probable frequency of occurrence and economic impact.

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Benton Says EFT Commission Planning Total Inquiry

By Toni Wiseman
Of the CW Staff

CHICAGO – The National Commission on Electronic Funds Transfer (EFT) is planning a thorough inquiry into the full range of concerns, both present and future, which stem from the expansion of EFT systems, John B. Benton told attendees of a Payment Systems Symposium here recently.

Benton is executive director of the commission, which was established last October to evaluate the likely consequences of alternative EFT systems in the years to come and to recommend appropriate administrative action or legislation.

While industry sources feared the commission would limit itself to investigating the market share aspect of EFT, Benton made it clear the commission's range of issues will be much broader and include the impact of EFT systems on competition, monetary policy, international implications, rights of privacy and consumer convenience.

Benton also called for participation and input from users, providers, suppliers and regulators of EFT systems, stating these individuals and bodies have "a profound responsibility to make expert contributions."

Commission Goals

In order to conduct a thorough investigation of EFT, the commission must study the basic concepts, assumptions and beliefs which underlie today's thinking on the subject, Benton said.

It must also identify the individual types of participants in EFT systems and understand how they relate to one another – how changes in the behavior of any one participant, whether they are imposed or market-driven, can cause reverberations throughout the entire system of participants, he said.

"Finally, we must assess the impacts of the consequences of future EFT systems and of broad social changes, particularly as they might threaten the principles of capitalism, competitive markets, freedom of individual choice and social justice upon which our nation is based," he stated.

Toward this end, the commission has broken itself down into smaller working groups, four "committees of perspectives," to ensure no major policy issue is missed in its possible impact on users; provider, regulators and suppliers of EFT systems and services.

The commission has also developed a basic definition of EFT which it will seek to further elaborate in the coming months, Benton said. According to the definition, EFT is "a kind of payment system in which the processing and communications necessary to effect economic exchange, and the processing and communication necessary for the production and distribution of services incidental or related to economic exchange, are dependent wholly or in large part on the use of electronics."

Eight Investigations Set

The commission has established eight general categories which it will examine during its two-year charter.

The first category, use and control of EFT systems, involves the issue of which institutions, public or private, will or should own EFT systems or subsystems – a question which may or may not be entirely decided by free market interplay, Benton said.

A related issue is which institutions will or should have access to which EFT systems and subsystems and under what terms and conditions.

Both issues will require an examination of actual or possible regulatory mechanisms, not only to indicate how patterns of ownership and access may evolve, but also to provide insight into the types of regulatory changes that may be required by recommended alternative arrangements for ownership or access.

The second category of investigation involves national economic policy implications. "One major kind of economic policy tool, that of monetary policy, may be made less effective by the implementation of EFT. This could result in part because of the changing definition of 'money'," Benton said.

The commission also plans to make a comprehensive cost/benefit analysis of EFT from a national perspective because the costs of an EFT system and the related economies of scale will help determine the economic feasibility of competing EFT systems.

It is also important to understand how the costs of EFT systems will be allocated among users and providers of the systems, Benton noted.

The fourth category of investigation will cover the management of EFT information, including the use of personal financial information which may provide a descriptive record of an individual's life style and his political, economic and religious beliefs, Benton said.

Recordkeeping practices will also be covered by the commission because, as electronics technology assists or replaces paper in financial transactions, existing practices may be inappropriate for evidentiary purposes, he stated.

Sixth on the list of investigative areas is telecommunications. "A prime question is the demand which EFT would place on the nation's common carrier systems, which distribute a resource (telecommunications capacity) which is fixed, at least in the short run," Benton said.

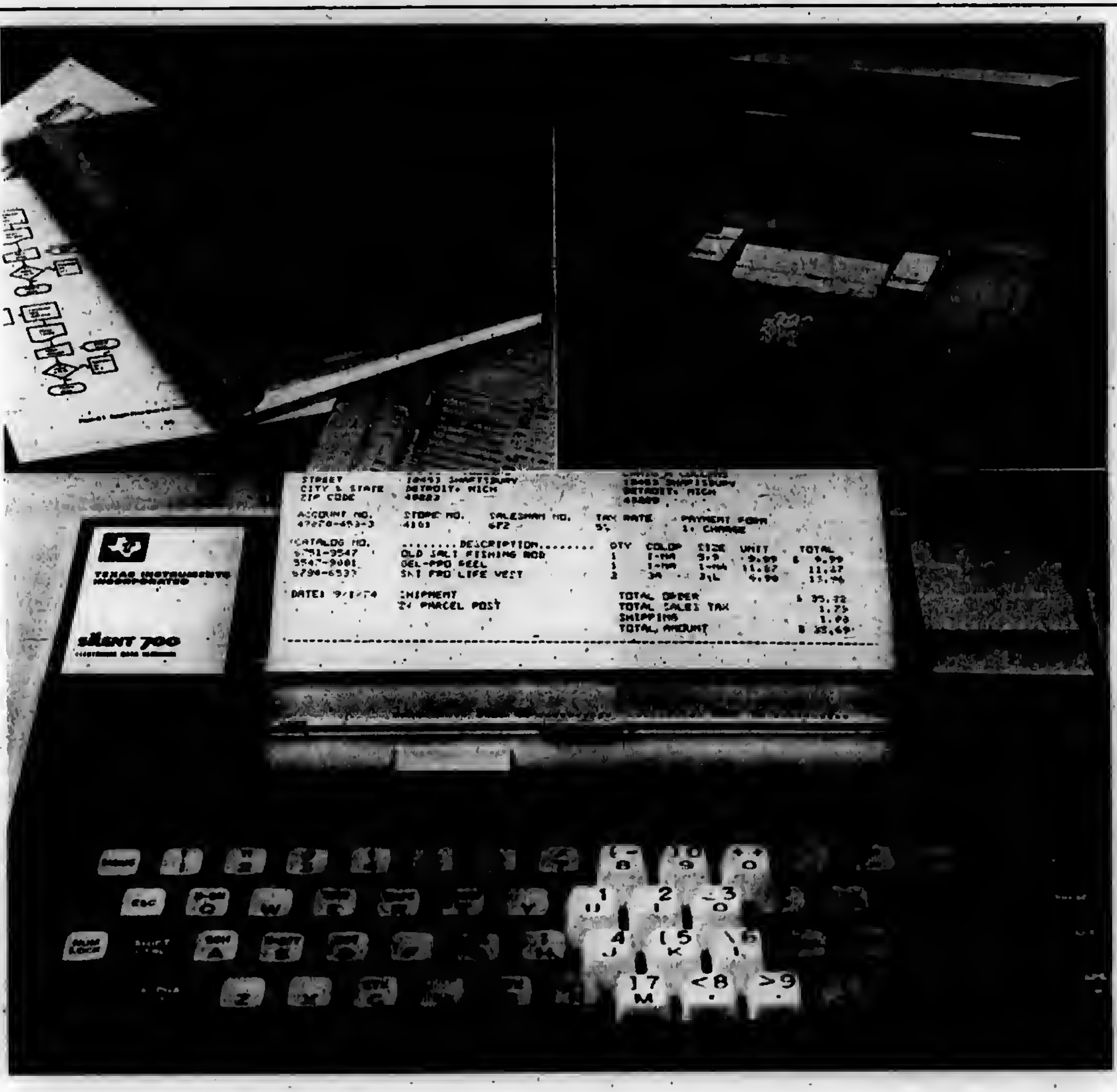
"A related question is whether the emerging EFT market may possess such inherent economic strength that new businesses will emerge to provide EFT telecommunications systems," he added.

Technological factors will also come under commission investigation, including questions of integration and systems compatibility and of security.

Finally, the Commission plans to look at international developments to see if foreign experience with EFT capabilities or developmental program can be instructive in policy deliberations on actual or potential U.S. systems, Benton said.

The restructuring of financial institutions is not covered by any of these eight areas, he said, mainly because of the global relevance of that issue.

In addition, Benton said, he feels financial restructuring is more accurately viewed as a possible output of the commission's analysis and is miscast when categorized as a specific subject of analysis.



TEXAS INS

Safeguards Proposed

WASHINGTON, D.C. – The insurance industry should adopt safeguards to assure an individual does not sign away his right to privacy when he authorizes an insurance company to access his medical files, according to recent testimony here.

Benjamin Lipson, a Boston insurance agent, told the Privacy Protection Study Commission the following safeguards should be adopted:

- Blanket authorization forms should carry a time limit.
- Photocopying of authorization forms should be prohibited without specific informed consent.
- The consumer should be given a place to turn when there is reason to believe his privacy has been violated.
- Any remedies adopted should contain a provision that makes null and void within 90 days all outstanding previously granted authorizations.

Systems 'Unwitting Participants'

Insurance Firms Seen Invading Privacy

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – Many Americans do not buy life insurance or take advantage of health insurance benefits they are entitled to because they fear invasions of privacy in which computers are "unwitting participants."

Many patients who use insurance plans to help pay for psychiatric counseling run the risk of losing their jobs because of the stigma attached to psychotherapy and the fact that claims are not kept confidential, psychiatrist Jerome S. Biegler told members of the Privacy Protection Study Commission here recently.

Biegler, who is chairman of the American Psychiatric Association (APA), was one of the witnesses heard by the commission at its hearings on information practices of the insurance industry.

Persons who have filed claims to help pay for treatment of venereal disease or a heart attack, for example, have found this information is disseminated without their authorization and, as a result, It is not uncommon to lose other seemingly unrelated privileges, APA's task force on confidentiality found.

A California physician who had a heart attack, for example, returned home after a complete recovery only to find his auto insurance had been canceled on the basis he was a poor risk, Biegler said.

'Open-Ended Intrusion'

When an individual applies for life insurance, he signs a form authorizing "any licensed. physician, medical practitioner, hospital . . . insurance company . . . or other organization having any record or knowledge of the individual or his health to give to the insurance company any such information," according to Benjamin Lipson, a Boston insurance agent.

A photocopy of the signed authorization Is considered as valid as the original, Lipson said.

This is an "open-ended intrusion" into an individual's personal life," he said. It has "no time limit" and allows insurance companies to go into individual's computerized records at the Medical Information Bureau time after time for information on health as well as non-health-related data such as sexual habits, drinking habits and hobbies.

Lipson specializes in getting life insurance policies for individuals who have been refused standardized coverage.

As a result, many people avoid getting policies or using their policies.

"A Maryland psychiatrist reported recently that between 1963 and 1975, patients of his having federal employees' health benefits with Blue Cross paid a total of $168,075 out of their own pockets for psychiatric care that otherwise would have been covered or defrayed by their insurance," Lipson said.

This is an especially difficult problem for people in the military, Biegler said.

Many young officers who have very complete insurance coverage under a program called Civilian Health and Medical Program for the Uniformed Services (Champus) would never file a claim because when those claims forms go back to their personnel offices and get into their files, their futures are jeopardized, he said.

Much of the privacy invasions engendered by the insurance industry are laid at the feet of the Medical Information Bureau, (MIB), an information clearinghouse that serves insurance companies.

Information in the MIB data bank is used by about 700 life insurance companies to help "flag" bad risks for life insurance coverage, according to Neal M. Day, MIB executive director and general counsel.

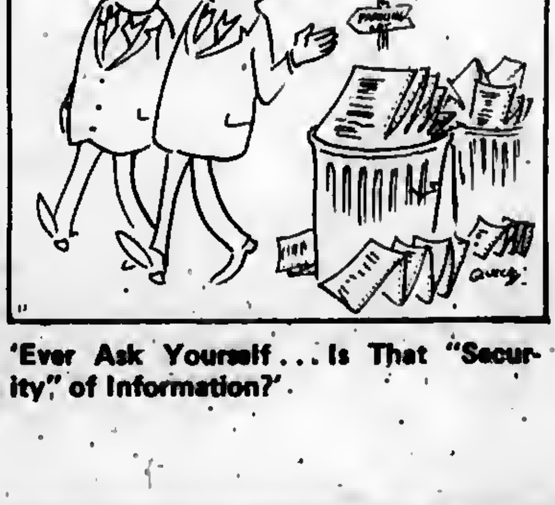
Over the years, MIB officials have emphasized that health data is not maintained in their files or used for "underwriting decisions."

However, during Day's questioning by the commission, it became apparent that in some cases such information is also used to make underwriting decisions.

If a life insurance company finds out that a year ago an individual had a health claim of some kind, that company is obliged to put that information in MIB not as health claim data but as underwriting information, Lipson said.

MIB attempts to enforce Its standards through an on-site inspection program that involves looking at 20 randomly chosen files of each of its member companies per visit, Day said.

To date, 1,500 such files have been inspected, and only 40 to 50 files showed use of health claim data for making underwriting decisions, Day said.



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Machines Get Vote of Confidence for Calif. Primary

By Esther Surden
Of the CW Staff

SACRAMENTO, Calif. – What do Jerry Brown and the computers in the Secretary of State's office here have in common?

They both performed admirably during this state's Presidential primary June 8.

When the last vote was cast in the primary, computers here tallied the results for the semiofficial canvass.

After the vote was tallied, the equipment used to count it was dismantled and returned to its vendors until a month before the next election.

"It must be a losing proposition for the vendors." George Boyd, DP manager, said.

Californians voted on about 500 candidates in 58 counties and 4,044 precincts, Boyd said. Offices up for grabs included President, U.S. senator, U.S. representative, half of the State Senate seats and the entire State Assembly.

The voters also were asked to decide on some 15 controversial state propositions, Boyd said.

All of the races were kept tracked by two IBM 370/168 mainframes at the Teale Data Center, reached via telephone lines and a Data 100 remote job entry terminal at the Secretary of State's office.

Teale acts as "my operations center," Boyd explained. It is a service bureau with responsibility to 38 other state agencies as well as the Secretary of State's office, he noted.

Beginning at 9 p.m. on election night, voting information was transmitted to the Secretary of State's office either over the telephone or, in the case of the state's six largest counties, via IBM 1050 data communications card-oriented systems.

For the balance of the counties, the 16-member election night data entry staff, along with five programmer/analysts sat at telephones in front of IBM 3270 displays and entered the data directly into the Data 100 batch system in the office.

The data was then transmitted to the IBM mainframe located across town over four 2,400 bit/sec half-duplex lines and one 9,600 bit/sec full-duplex line.

It took about 17 minutes for the vote to be transmitted from the six largest counties to the 370s. "The output these counties produced is literally machine-compatible with the state computer. The only reason we break it down to transmit cards is because it's safer, more foolproof and less costly than going computer-to-computer," Boyd said.

On the average, it takes about 25 minutes for the data entry staff to absorb one of the non-card-oriented county's reports and enter it into the computers in Sacramento, Boyd said.

Debut of CRTs

This primary marked the first time CRTs were used in an election in California at the state level, the brainchild of Rico Nannini, California assistant secretary of state, Boyd noted. The procedure went very well, he added.

Throughout the evening the Secretary of State's office took an average of seven reports per county and printed out hard-copy reports on the status of the voting.

"The information system we had was totally real-time at the state level; as the vote was accumulated by county, it was made immediately available to state officials and the press.

"They could make inquiries on the races to determine not only how many votes have been cast per candidate but also, in the case of the Democratic party, how the delegate races were going."

The system kept a running total of the delegate race in the Democratic primary since it was not a "winner-take-all" race, Boyd explained.

By 9:35 the morning following election day, all votes in California had been counted, Boyd said, and the semiofficial canvass had been produced.

"And when we produced it we printed it simultaneously in Sacramento and Los Angeles," he said. The state was "two hours closer to the counties" in this election, he said.

Using the Data 100 equipment, which includes a 600 line/min printer, the state printed 500,000 lines before it was finished processing, Boyd said, adding the printer was not designed for such use but held up well.

DPers Back at Work One Day After Fire

LAWRENCE, Mass. – Despite a fire that ravaged the data entry equipment in the Massachusetts Department of Public Welfare's regional data control unit here recently, work proceeded as usual within one work day of the fire.

Cogar Corp.'s Brighton office was able to replace the hardware lost in the fire as well as the custom software used by the regional center, which processes the SS9A recipient payment program, a spokesman said.

The fire occurred Saturday, June 5, knocking out a Cogar 1500 processing system comprised of six 1501 intelligent terminals, one 125 line/min printer, a magnetic tape converter and various bisynchronous communications gear.

Cogar was notified of the loss on Monday and by Tuesday the regional data center was up and running, according to Val Azbedian, director of the program management office in Boston, who extended his personal thanks to Cogar Corp. for its quick work.

MIT Center Sets Seminar On Current Research Issues

CAMBRIDGE, Mass. – "Current Issues in Information Systems Research" will be discussed at an Aug. 3-6 seminar here sponsored by MIT's Center for Information Systems Research.

The issues under consideration will include distributed processing, decision support systems, operating systems and new technologies, such as microprocessors.

Emphasis during the lecture/discussion sessions will be on management problems such as performance evaluation, configuration selection, privacy and security, information system effectiveness and implementation strategies, the MIT center said.

Tuition for the four-day seminar, which will be held on the MIT campus, is $450. Further information is available from C. Lawrence Meador, CISR, E53-311, Sloan School of Management, MIT, 50 Memorial Drive, Cambridge, Mass. 02139.

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No One Solution Exists, Users Told

Management/DP Liaison Aided by Corporate Structure

By Molly Upton

Of the CW Staff

NEW YORK – There is no one solution to fit every DP department's problems of liaison with top management, but there are solutions, George Glaser told a session entitled "Executive Management Must Become Involved" at a conference here recently.

A survey conducted by Gopal Kapur, another speaker, and himself of 35 DP managers indicated a strong correlation between the effective method for a particular DP department and the manner in which the overall corporation was structured and administered, he said.

Both Kapur and Glaser stressed the need for good management within the DP department and also for corporate management to understand the inner workings of the DP department. Kapur and Glaser are consultants.

Perhaps it is not so much a question of having top management get its hands "dirty" with DP involvement and planning, but having a state where top management has already gotten its hands dirty with experience in the DP department, Kapur said.

This can be done through programs directed at corporate managers who are peers of the DP manager, i.e. middle management, or even earlier by rotating trainees through the DP department, he said.

DP a Pain in the Neck

All responsibility for planning DP solutions to corporate problems cannot be left to the DP technicians who do not see all the corporate needs, Kapur said.

For a large number of firms, the DP department is a pain in the neck or worse, he said. Chief executives are frustrated by their inability to understand the technological capabilities and manpower needs within the department.

To compound the situation, chief executives are often fed a line by the vendor that leads them to ask the impossible of the DP department, he said.

Many managers are either bitter by experience with the DP department, intimidated by the DP department or fed up, he said.

A DP manager should first of all be a good manager, and then a good technician, Kapur said. Rotating future DP managers through user departments would also be useful, he said.

The DP manager should be bilingual, able to translate computerese to the management and advise and warn them.

On the other hand, the executive should ask about the pitfalls of any project or new system.

A key element in the success of any project undertaken by the DP department is acceptance of that project by the corporate user department or manager.

If a manager perceives a system as a threat to his status or job, then there's trouble, Kapur said.

However, if the department or manager accepts the idea and helps design it, the system has a much better chance of succeeding, he said.

Unsuccessful Methods

Among the methods found unsuccessful, they said, was to ignore the user department during the design of the system.

Other methods that have a low success rate include "music appreciation" courses, or seminars, and setting up steering committees without specific goals staffed by people who often don't attend.

The seminars, designed to increase management's acquaintance with DP functions, average 2.5 days of "music appreciation" and generally represent a bombardment of DP jargon, Kapur said.

Glaser urged DP departments to recognize their needs, such as financial support, for what they are, rather than wrap them into the term "involvement."

For management to become involved, the DP department has to do things in return, he said. Only if a DP manager's peers and superiors think he is a winner will he get support, Glaser said.

More critical than reporting to the president of the company is reporting to a capable, effective manager, Glaser said.

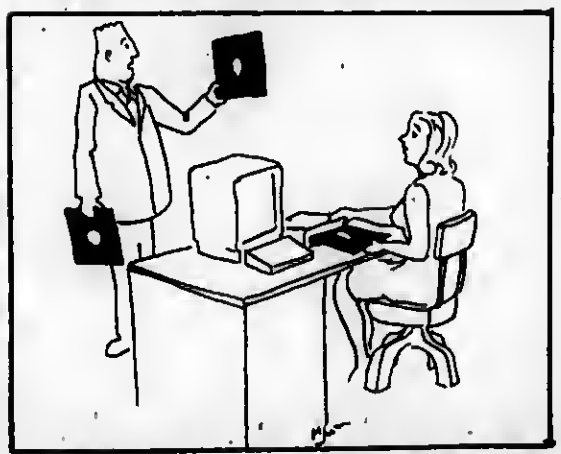
The use of a committee works well if it fits with the organizational philosophy, he said, citing one installation where monthly meetings were held with agendas circulated well in advance for comments. The participants at these meetings, run by a former Marine colonel, were very well prepared, he said.

The efficacy of long-range planning also depends on its consistency with overall corporate style of management, he said. However, a five-year plan can be used by the DP manager to weather management changes.

There were also various styles of personal liaison with users that proved effective, he said.

For instance, some DP managers met the user departments at monthly meetings or planned lunches with users. Others modeled the internal DP structure so it was nearly identical with that of the corporation, which resulted in the user departments interacting with a specific group of people within DP.

The job of DP director, Kapur said, is so large that often installations have two people, one as director, who reports to corporate management and is responsible for long-range, overall plans, and the other the DP manager, who is thus freed to fight the fires of day-to-day concerns.



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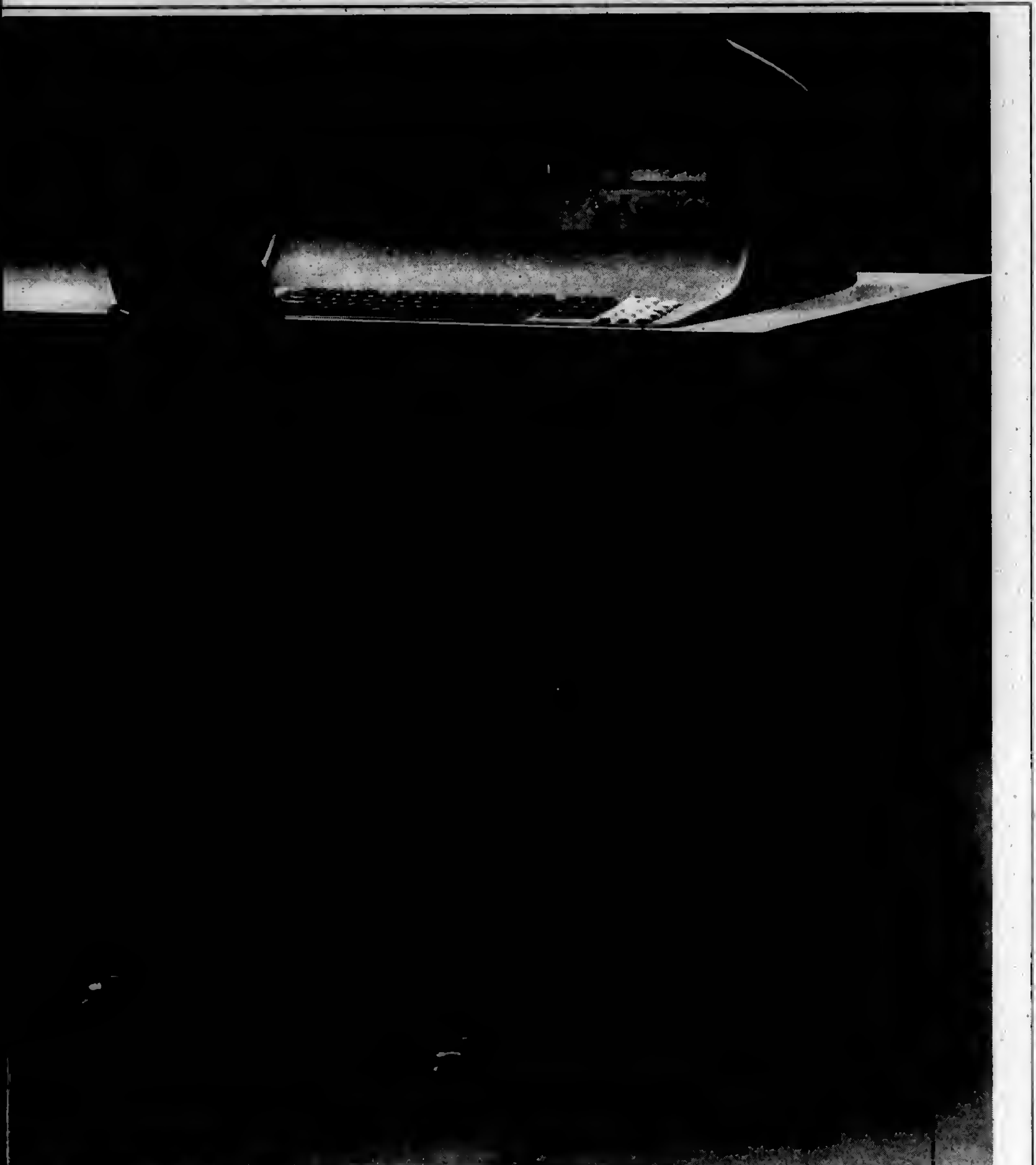

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Editorial

Independent Study Needed

The fiasco at the Social Security Administration's (SSA) DP operation continues to unfold.

While it is clear the organization uses its computer systems less than 50% of the time, the administration still is pressing for a new facility [CW, June 21] and is planning to take delivery on two IBM 370/168s that are currently in storage and for which the SSA has no room.

At the same time SSA apparently is trying to hold up a report prepared by the General Accounting Office that clearly outlined the underutilization of DP facilities. (*Computerworld* incorrectly reported last week that the report was available – it can be obtained only by selected congressmen.)

That report should be made available immediately so interested DP professionals and others can study and understand the magnitude of the problems at SSA – and possibly help to suggest solutions to the problems.

This could be an excellent function for the year-old Washington, D.C., office of the American Federation of Information Processing Societies (Afips).

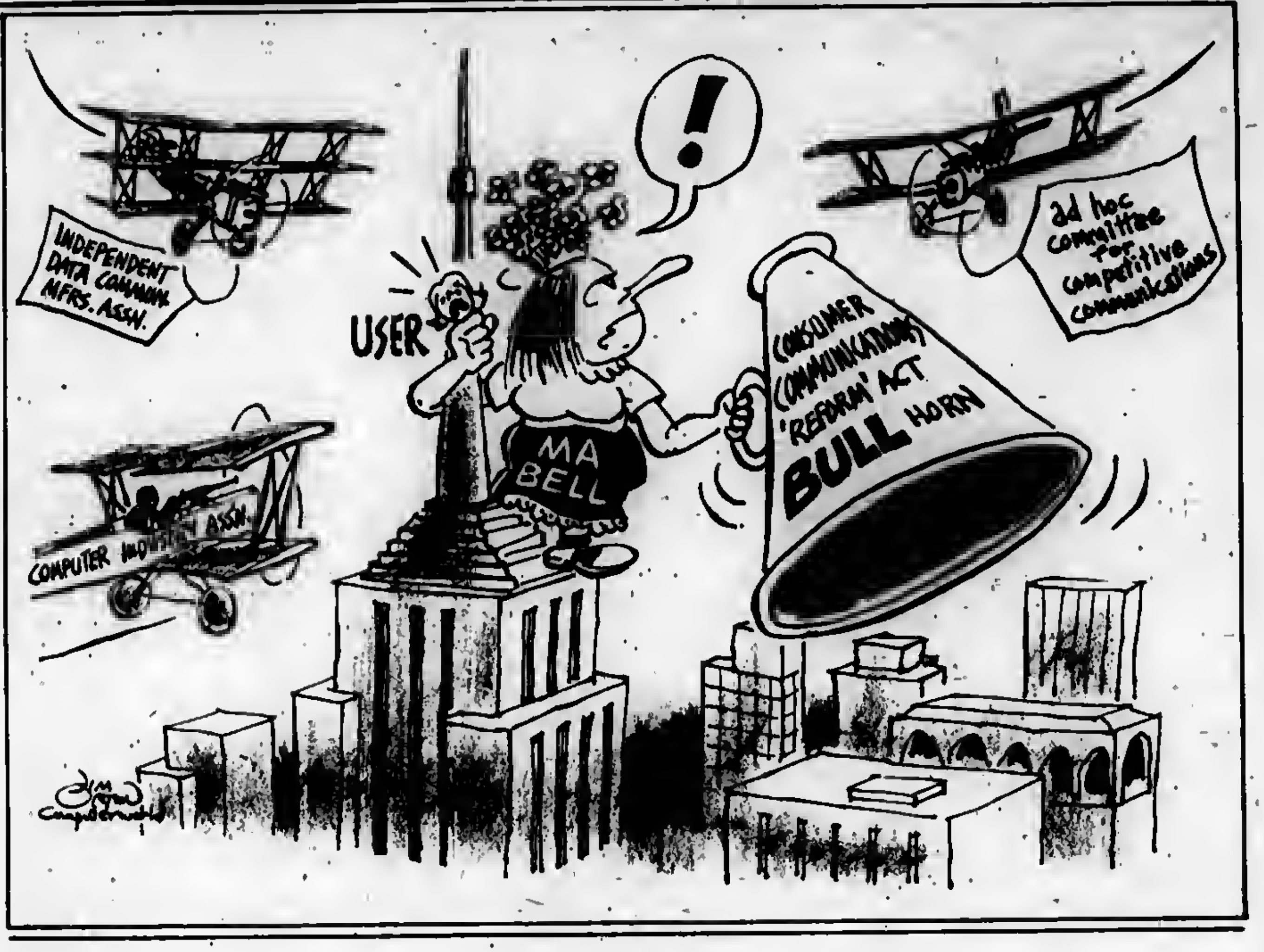
That office should immediately contact SSA and interested congressional investigators and offer to do a complete, independent study – not of the problems, which are well documented – but of various solutions that might help alleviate those problems.

The Afips organization can draw on the resources of the membership of its constituent societies for such a study and could perform a real service not only to SSA but also to the general public that foots the bill for the waste in the SSA operation.

It is also an issue that can be attacked solely on technical grounds, since the major questions raised are about the best methods for improving the utilization of equipment.

Afips, by its tax-free status, has to tread lightly on issues of public policy, but those questions are not raised in the present situation.

In fact the fit is so natural in this case, it is surprising Afips has not volunteered – at least publicly – to help out.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Letters to the Editor

System With Responsibilities Like Erda's Needs More Checks

After reading "Time-Sharing Center Aids Study of Nuclear Power" in the June 7 *Computerworld* I was unhappy to realize the Energy Research and Development Administration again chose a Control Data Corp. Cyber 73 to handle critical activities indigenous to nuclear-related information systems.

It seems strange Erda trusts a system with no internal error checking to handle "numerical simulation of experiments intended to provide better understanding of the complex plasma interactions which occur during controlled thermonuclear experiments." A Cyber 73 does not even have parity in central memory.

In my experience, Cybers fail soft over a period of days before a hard failure. These failures can only be detected by analyzing results of applications programs.

I question Erda's choice of computer in handling this type of data. The Livermore facility is not the only Erda installation using Cybers for managing this kind of nuclear information. Many of the Erda sites use Cybers for designing and monitoring radioactive waste material and determining parameters for reactor start-up.

I would like to see a few more checks in the system with responsibilities like these.

Phillips Hughes

Olympia, Wash.

Adapso to Fight Reform Act; Other User Groups Urged to Join

A giant battle is shaping up in Washington, D.C., as signified in *Computerworld's* editorial of June 7 dealing with the misnamed "Consumer Communications Reform Act."

This legislation, while couched in public interest terms, is insidious at best. Interestingly enough, The Association of Data Processing Service Organizations (Adapso) is both a trade association and very much a user group (equipment and communications). We concur that every user group should actively participate on this subject. Adapso certainly is.

At a recent meeting of Adapso's Remote Processing Services Section, specific actions were determined to combat the deleterious effects this legislation promulgates.

As we view it, this legislation is an all-out effort of AT&T to weaken the regulatory structure of the Federal Communications Commission (FCC) and to further its aims of total monopoly of the communications field. Specifics of our program will be issued shortly.

J.L. Dreyer
Executive Vice-President

Adapso
Montvale, N.J.

'Groschly Disappointed'

I don't know who he is or what he is and am certainly not a fan, but with all due respect to Herb Grosch I was "groschly" disappointed in "Japan I."

Initially I assumed it to mean "Japan, Article Number One" and eagerly read into it. But instead it turned out to be Grosch praising the history and accomplishments of Grosch.

It only pointed out his nonability to inform and his superability to ramble and digress (cheap potshots at "ariline sales policy" and "punks instead of trained help").

I hope "Japan II" and "Japan III" are more interesting and informative and don't make the "I" mean "Watakushi-wa" but rather "Ichiban."

Mel Tosch

Detroit, Mich.

Data Past

Five Years Ago
June 30, 1971

WASHINGTON, D.C. – Ralph Nader asked the computer community to develop balanced uses of computers for returning power to the consumer and proposed a consumer information system, which was being worked on voluntarily by a number of computer professionals under the aegis of Nader's public interest research group.

– – –

WHITE PLAINS, N.Y. – IBM rearranged some maintenance prices and services and, for the most part, increased prices at its Service Bureau Corp.'s subsidiary's Datacenters. Rates on 14 machine models were reduced, charges on 116 equipment models were raised, and increases of 11% on the average were levied on all 360s, the 370/155, 2314 disks and 2401 series tape drives.

Eight Years Ago
June 26, 1968

WHITE PLAINS, N.Y. – IBM announced a faster 360/20 CPU, with double the main memory (from 16K- to 32K bytes). It was said to provide for more overlapping and considerably faster internal execution.

– – –

LOS ANGELES – Computer Sciences Corp. (CSC) entered the time-sharing market with plans to open time-sharing centers in 20 U.S. and Canadaina cities at a cost of about $50 million. CSC had been operating a remote batch processing network serving more than 150 organizations in the Western U.S. and Canada.

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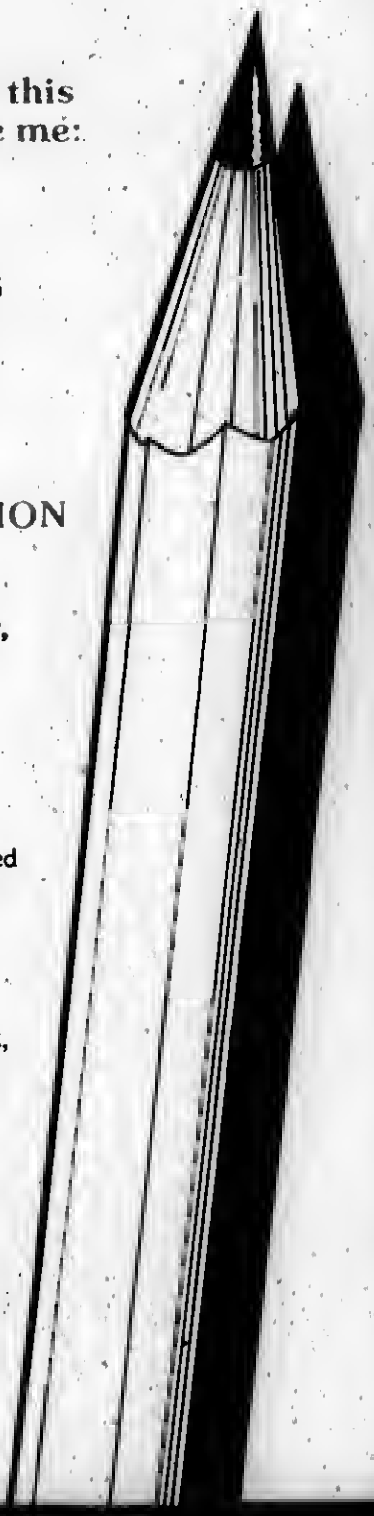

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Japan III

In two previous columns I wrote about my recent visit to Fujitsu and environs, and about how impressed I was to go at least partially behind the scenes in a company I believe will be the strongest challenge to IBM, at least outside the U.S., in the coming years. I carried the story to where I was on the stage at Nagoya, pontificating away in my usual blithe fashion.

CW readers who don't care about the Japanese banking automation ventures or about Fujitsu selling equipment in Jugoslavia may nevertheless wonder whether they can benefit on their home turf. Well, certainly the Japanese challenge, which has more *knowledgeable* government support than the French, German, or British equivalents, can help worldwide, if only by keeping Cary & Co. on their toes. Certainly selected Japanese components, terminals, peripheral gear, and very small and very large computers – the latter perhaps in "Amdahl mode" – will be available here. In fact, Honeywell is going to get its chips, or at least lots of them, from Nippon Electric. But there will be zones of avoidance: I don't see any encroachment here on the 360/30, 370/135 market; nor any immediate challenge to DEC and its competitors – not in North America. And never in software, in spite of the recent CII-Bull gesture; there aren't enough Japenese software artists to do the work at home, and the applications cultural barrier is high besides.

On the other hand, Toshiba has just entered the microprocessor/hobbyist market; computer games and toys can be expected; data communications gear, in spite of the different native environment, is being offered all over the world, and I understand it is competitive with German and Swedish (and French and English) equivalents.

One specific thing I called for at the Facom user meeting, looking hopefully at Fujitsu president Kobayashi as I did so, was more radical experiments in architecture. So far, the Fujitsu M-series multiprocessors, the Amdahl 470, the big Hitachi machines, and I presume most of the smaller computers of all the Japenese manufacturers have been very like the 360/370 system design. In fact, many are intended to be software (at least) compatible. I would like to see Fujitsu, or Hitachi or Nippon Electric less urgently perhaps, use its own funds or request government support to design and prototype one or more radically different architectures. I said clearly that there was major risk; that throughput might be disappointing, costs excessive at the production level, or (most likely) the novel result unsalable against IBM denigration. But it needs doing: needs doing desperately, somewhere in the world. And American firms seem not to have the nerve – Burroughs is somewhat of an exception, of course. This is a major place where the Ministry of International Trade and Industry and the Science and Technology Agency could really help Japanese outfits, for the risks are certainly very high.

In response to a question from the floor about weaknesses in the Japanese effort (a very good and remarkable question), I pointed out that Japanese success in Western Europe, and ultimately just about everywhere in the world outside the Far East, might well be dependent on, and in any case would be greatly helped by, adopting the IBM World Trade strategy of hiring nationals. As salesmen, as maintenance engineers, as systems people, and as managers; not just as factory help. How well that got through translation and the remnants of the old Japanese xenophobia, I can't be sure – but I meant it!

I was ushered into a superb lunch with Mutsuro Umezu of domestic marketing, and then sent out on tour while the indigenes went back to work. I once sat through a whole session of unalleviated Russian (and Cyrillic slides) without translation, in the Soviet Union; my Japanese hosts were kinder.

I've mentioned the elegant reception, better than any SHARE bash I can recall. Just before, the Facom Family chairman had presented me with "a very small gift" – actually, a lavish one. And for my wife, the overseas marketing directors had salvaged the geisha's parasol, green silk and black-and-orange lacquer, from the detritus of a business-and-pleasure drinking bout some nights before, and wrapped it carefully for transport back to Sunnyvale. The social as well as the technical side was perfectly arranged.

I hope to go again, perhaps in October or November when the maples have turned and the weather is dry and clear. I hope to visit some users, not perhaps just Fujitsu but even IBM. The market is expanding so rapidly that an outsider is hard put to keep up; the space program was a case in point. I'm deeply interested in whether Nippon Electric software modules will work in Honeywell data management systems; I'd like to know more about some of the projects at NTT (the telephone company). And I want to rent a car and drive around those green mountains I saw from the train window, or ski in Hokkaido, if winter has come. Pat McGovern, the CW publisher, has had *fugu* and survived; I should do the same.

The first six trips were terrific; I look forward to the next (six, that is)!

Herb Grosch

Stolen Car Messages an Example

Training in System Dangers Could Prevent Tragedies

Last year it was in Florida. Last week it was in Massachusetts, a dozen miles from where I live. The routine police inquiry came back with a false report that a car or motor bike was stolen [CW June 21]. As a result, soon after there was tragedy.

How does it happen? How did it then happen again?

The latest explanation is that the motor bike had been properly registered 20 days earlier and that the registration had not gone into the computer. Apparently it takes two or three weeks routinely to enter new registrations and sometimes it takes months. The "stolen" report itself was some years old.

This is essentially the same problem as the Florida case [CW Dec. 10]. There an old, stolen report was not updated to show the issue of an identical registration number to prevent confusion.

In any event, the current explanations are inadequate. They do not explain why there is a reliance on other nonpriority procedures to remove a known file inaccuracy or danger.

Surely it doesn't take that long to remove the stolen report, even if registrations have to be backlogged, for some unknown reason.

Factually, the answer to the problem appears to be in the publicity issued some years ago when these database systems were first being sold to many police departments. The focus at that time was on the danger to policemen approaching unknown cars, not on any danger to people being approached.

The Taylor Report

By

Alan Taylor, CDP

Approach With Caution

The systems were designed to alert the policeman when to approach with more care than usual. Now it never hurts to exercise caution. So, approaching any car cautiously, stolen or not, seems innocuous.

There was no apparent reason to rush to prevent the system from warning of possible problems. Removing stolen-car reports was not a priority item. It could be, and it was left to routine action.

Now of course, it is known there are problems. The data on stolen cars in the file can lead to death. Yet clearly the "approach-with-caution" system must be retained. Policemen are entitled to all possible warning. So what is the solution?

Quick Cancellations

It seems to me file items that are dangerous should always have a way of being canceled quickly. In this case, part of the registration process should be to first clear out all dangerous data in the standing file. Can you see any reason why not? Or do you know of some better systems solution to the mistaken stolen car report problem?

Putting the system right does not end the problem, however. Even if the system logic is complete, the success of a system is not assured. It must also produce the correct results.

The current systems are not producing the correct results, so something has to change.

It appears what is happening is the behavior of the police may be changing. When a stolen car report is given, they think it definitely is a stolen car, when in fact no one yet knows for sure. This difference is a subtle one and easy to forget.

Probably the best method of handling it would be to have all failures of the system brought forcefully to the attention of system users.

This could be done with the stolen car message itself, but I don't think this would work. It would be too routine and would be ignored in any active situation. However, it might help and couldn't harm.

Training in the danger seems to be the only real solution. I wonder if the Massachusetts people had been trained (or retrained) after the Florida incident?

I wonder whether the policemen now on the roads in this country have yet been trained about Massachusetts? I hope so, because trained users are the only ones that should be allowed to use dangerous systems. And we know the stolen car system is a dangerous one.

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Users Urged to Block Reform Act

Someday Smithsonian Could Hold Non-Bell Memorabilia

Reader Commentary

By R.J. Kaufman

Special to Computerworld

The year is 1984. Our families arrived in Washington, D.C., on Saturday. Monday morning was to see the start of a joint meeting between the Association of Data Communications Users (ADCU), the Data Processing Management Association (DPMA) and the Association for Computing Machinery (ACM). After checking in at the hotel, serveral of my computer associates said, "Let's go over to the Smithsonian."

So off we went to view America's memorabilia at the Smithsonian. While the children seem to be attracted to the spirit of St. Louis and the space capsules, our eyes seemed to take us to a corner of the room which had blinking lights.

Above the blinking lights was a gold sign which read, "Data Communications Circa 1968-1976." There in a glass-enclosed booth stood a modem. There was an inscription above it which stated: "This is the last independent modem ever produced."

A small inscribed plaque underneath it said: "This modem, unlike the telephone company modems in existence today, had options and diagnostics that were far ahead of its time."

Items and options, such as LSI, diagnostics, special quality monitoring systems, special data compression techniques, automatic trouble detection and other options were included. For service, all you had to do was swap a new one in and swap the old one out in approximately two minutes, the plaque said.

Next to the modem was a little black box which said, "Minicomputer for Packet-Switched Network." Underneath the unit was the following: "This minicomputer was used in what was called packet-switching." This allowed users of data communications equipment to pay only for the data they transmitted, and not for the time they used, which is currently the case for voice and data.

This minicomputer allowed hundreds of other computers and terminals to be all on one network, so that computers and terminals could talk to one another, even though each system was different.

Next to the display, with the minicomputer was another display. It pictured a telephone. On top of the telephone it said, "Datadial."

The explanation of the telephone said this was a telephone which allowed the user to dial another computer or terminal in less than one second and digitally connect the units together. Charges were based on how many bits were transmitted.

Then finally, next to the Data Transmission Co. "Datadial" telephone, was the original Carterfone. An inscription below it stated: "Here is the device which for a period of eight years opened the door to the latest and advanced technology in data communications and voice communications for the user." It did in 10 years what the telephone companies couldn't do in 50 years.

It brought the power of the computer closer to everyone. It provided terminals and other data communications to learn by, terminals to do business by and terminals and equipment to heal the sick by. Children were now able to learn history by computers, and doctors were able to get computer analysis of EKGs.

Data movement technology was pushed from 10 char./sec to 250 kbit/sec. Transmission services were developed to transmit the language of computers and not the language of voice. But it all went down the drain and came to a screeching halt in 1976.

For 1976 was the year congress passed the Consumer Communications Reform Act, known as H.R. 12323 and S. 3192. The congressmen who voted for the bill really didn't know what they were doing. They were scared by the clout of the big telephone company and the small telephone companies.

They were told if all this "harmful competition" wasn't eliminated, the consumer was going to pay a higher telephone bill. Of course, this was sheer nonsense as had been proved by several major consulting companies in the U.S. and the Federal Communications Commission.

But the data communications user, and even the one-time interconnect user, failed to inform their congressmen that before passing such a bill, every argument, pro and con, ought to be heard.

So our elected people up on Capitol Hill passed a bill into law about which they really knew nothing. The bill forever changed the Space-Age technology, which brought the power of the computer closer to the people of the world.

Because the users of this technology thought the Consumer Communications Reform Act of 1976 was a big joke, something to be passed over lightly, their technology was stopped dead in its tracks.

A technology which was started and had mushroomed to deliver economically the power of the computer to our homes, schools and businesses through the use of a telephone wire now came to an abrupt halt.

The above story can be true, if users don't wake up now. Users should urge their elected officials in Congress to hear the whole story from all sides before making a commitment.

Kaufman is operation systems project manager at Damon Corp. in Needham Heights, Mass.

DPers Feared Losing Innovator Status

By Ron Stewart

Special to Computerworld

The May 31 issue of *Computerworld* carried a Reader Commentary by Marianne Marino criticizing an editorial in the April issue of *Thruput*, the newsletter of the Association of Computer Programmers and Analysts (Acpa).

As the editor of *Thruput*, I feel moved to comment on some of Marino's comments. However, I would also like to recommend that CW readers obtain the editorial in Acpa's *Thruput* and read Marino's commentary in CW, as she made several very valid points which I will not touch upon below.

First, the thrust of the *Thriput* editorial was: "Hey, DP practitioner, we had better get our act together and start some serious consideration of things like certifiable computer installations, really good systems design, solid system and program controls, comprehensive standards, thorough project documentation and reporting and a uniform code of good practice."

Unless current DP practitioners begin thinking along these lines, we will abdicate the responsibility for further development of our profession one of these:

- A subset of the DP field (the DP auditors?).
- The accountants (who have already failed once in controlling the DP function).
- The Federal government (which has shown time and again how poorly it controls its own computer operations). This could very well relegate us to the role of technical support personnel rather than innovators.

My *Thruput* editorial emphatically echoed two excellent columns by CW's Alan Taylor [CW, Jan. 12 and 19], urging the DP professional society members into action along the same lines as the American Institute of Certified Public Accountants in developing standards and professional competence.

Evidently my call to action was more emphatic (and therefore more objectionable) than Taylor's, to arouse the ire of Marino!

In her commentary Marino reached the conclusion that because of management's authority to enforce auditor recommendations, "it is difficult to see how the auditing profession could gain control of the DP industry."

I agree, but I can easily see how we might abdicate our role in the development of standards, a uniform code or systems development methodology.

I strongly disagreed with Marino's use of the word "management," as it seemed to exclude DP management (and for that matter, auditing management).

As is pointed out in the original *Thruput* editorial, we have struggled long and hard to overcome 20-plus years of mismanagement by the accountants and the corporate financial area and have developed our own cadre of proven, seasoned DP managers. Now that we have had some success, it would be unfortunate to relinquish it to that very same financial management which also controls the internal auditors and influences the external ones.

Also I disagreed with Marino (and her choice of words) when she stated it "is hardly cause for weeping and gnashing of teeth on the part of DP (or is it Acpa?)" if management finds something of value in the recommendations of the auditors.

It is not so much that I "view the DP auditor as a competitor," but that I think it sad that the leadership in the area of standards development and the like must come from outside the mainstream of our field, from Marino's "reviewers" rather than from the innovators at the heart of our profession.

And I took exception to Marino's closing statement that "DP has made significant strides toward elimination of its growing pains . . . apparently Acpa would rather it eliminated the competition."

First, my editorial musings hardly reflected the policy of Acpa . . . for that she might look at *Thruput*'s monthly Chairman's Message or the reports on the activities of the Acpa Board.

Second, I hope it is clear from the above comments that I do not advocate elimination of competition, but wish to encourage participation by all levels and areas of our profession in guiding the future of our chosen field.

Finally, I would like to take a page from the views of Kenniston W. Lord, Jr., former president of the Society of Certified Data Processors (SCDP) and encourage the interchange of ideas and viewpoints between DP practitioners in the pages of CW or *Thruput* or any other vehicle of communication.

Only through the communication of differing positions on any pertinent issue can the majority of DP practitioners become aware of those issues.

Stewart is editor of Thruput *and an independent consultant.*

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NBS Conference Notes in Print

SPRINGFIELD, Va. – Proceedings of the second national symposium on the management of data elements in computer processing have been published by the National Bureau of Standards (NBS).

The 278-page book contains 28 technical papers on data management and standardization in areas such as data resource management, role of the data manager, communications needs for data standards, data dictionary/directory systems, product coding, use of check characters, data elements in bibliographic data bases, coding for clinical medicine, data standards for education and data base management systems.

Cosponsored by NBS and the American National Standards Institute, the symposium was held last Oct. 23-24. Over 300 representatives of government, industry and academia from 29 states and three foreign countries participated.

The symposium's theme was the need to recognize data as a tangible resource and to apply management methods equivalent to those controlling other valuable resources.

Cataloged as report number PB-249-530, the symposium proceedings can be obtained in paperback for $9.25 or on microfiche for $1.45 from the National Technical Information Service, Department of Commerce, 5285 Port Royal Road, Springfield, Va. 22151.

'Word/One' Ready for IBM CPUs

NEW YORK – The Word/One interactive text-processing system, long available as a service facility on the Bowne Time Sharing, Inc. network, is now packaged for installation on an IBM 360/370 user's in-house equipment, according to Bowne.

Designed to be used by typists, secretaries and others in the document-preparation and word-processing areas, Word/One enables users to enter and display textual information from a typewriter terminal and to use a broad range of editing and text reorganization facilities, Bowne said.

The software also supports a "comprehensive" range of data search and selective information retrieval features, a spokesman noted.

Word/One system features are said to include text editing with static line numbers. All text units are sequentially numbered as they are entered and these assignments remain static regardless of additions or deletions to the text, Bowne explained.

Replacement or insertion of new text can be on a line-by-line, word-by-word or character-by-character basis, and changes can be on either local or global parameters, the vendor added.

A number of "housekeeping" chores can be handled automatically by the system under user control, the spokesman said. These include such things as text centering, right-margin justification, page and paragraph numbering and underscoring and overstriking (which darkens the letters or words involved), Bowne noted.

The system also is reportedly capable of generating tables of contents on command and of marking those parts of a new draft which are changed from a previous version.

Word/One runs under OS/VS1 or VS2 or, with a different version, under DOS. The data set containing all Word/One application programs requires 10 cylinders of 2314 or 3330 space, while the accounting facilities require about another 20 cylinders, although this varies from site to site.

Lease price for a "typical 10- to 15-terminal system" is $1,200/mo, according to Bowne, which is at 345 Hudson St., New York, N.Y. 10014.

PCS Extends APL Workspace Size

VAN NUYS, Calif. – Proprietary Computer Systems, Inc. (PCS) has increased the size of its APL workspaces to 100,000 bytes from 64,000. PCS uses an enhanced version of IBM's APL.SV in its Computernet on-line computing service.

An APL workspace is the amount of core storage available to an individual user at one time. PCS' larger workspace size is two to three times bigger than the main memories of most minicomputers, it said.

A user can maintain his own private library of workspaces containing data and programs he has written; in addition, he can use PCS' library of ready-to-use application programs, the company said.

For large files of data, PCS has developed system software that is said to allow a user to directly address millions of bytes of data organized as a file. For these applications, PCS noted, it has also developed a higher-level language that can be used to operate on file data and to create finished management reports.

PCS charges .01 cent per 1,000 bytes per day.

PCS/Computernet offers local dial-up service from major cities in the U.S. and Europe.

PCS Is headquartered at 16625 Saticoy St., Van Nuys, Calif. 91406.

'Trend Analysis' Package Pulls Data From IMS Base

WHITE PLAINS, N.Y. – Although initially developed for financial institutions, the Trend Analysis/370 package from IBM can be used in other business areas such as manufacturing, retailing, distribution, processing and utilities, a spokesman said recently.

The program product enables users working with an IBM 370/145 or larger CPU and 3270 terminals to create and display three different types of business information reports, he explained.

With extra software, an IBM System 7 and a television set linked to the 370, the user can have the reports in various colors, IBM noted.

Single period comparisons, one of the basic report formats, compares the performance of several measures of an organization's activities – bank loans, deposits and withdrawals, for example – for a given period. This in effect provides "snapshots" of the organization's status, the spokesman said.

Historical analysis, another of the possible outputs, compares the performance of different elements, such as available credit, cash flow and investments, of a single company over a period of time.

Finally, historical comparison, which compares one element in several different companies over a period of time – assuming the user has built up the appropriate data base about other companies – is the third type of output from Trend Analysis/370.

Three Report Forms

Reports may be generated in tabular form, as bar graphs or as line charts and the output may be directed to the 3277 screen, an IBM 3286 printer or the user's television unit, according to IBM.

Standard report formats are useful because, although they limit the amount of individually desirable information that can be retrieved from the data base, they also simplify the user's interface with the system; the user merely picks items from several "menus" that appear on the 3270 screen, IBM said.

The package requires a 370/145 or larger CPU with a minimum of 1M byte of main memory. In addition to the Trend Analysis/370 software, users must also have IMS/VS installed, the spokesman noted.

First customer shipments of Trend Analysis/370 will begin this fall and the package will be available under license for $500/mo. The optional program enabling users to produce color graphs – if they have the System 7 and TV equipment as well as the 370 – will be $160/mo.

Neat/3 Program Building Eased With 'Pass/3' From Independent

CONCORD, Calif. – The Programming and Analysis Support System 3 (Pass/3) recently introduced by Century Analysis is a generator which produces Neat/3 source programs for NCR Century CPUs from "system-level" definitions, the independent said.

Programming effort and cost can be cut as much as 85% with this tool, the vendor claimed. But perhaps the most unusual aspect of Pass/3 is the way Century Analysis charges for its use – by the number of lines of code generated rather than a fixed monthly license fee.

To enables users to define their needs on the highest level possible, Pass/3 is said to support three levels of logic above that of Neat/3 itself. The level the vendor calls Fixed Logic takes into account the type of program being generated since, according to a spokesman, "report logic is completely different from capture logic."

So-called Specific Logic is produced based on input forms designed for a specific type of program. "Capture" input forms, for example, provide a means for the analyst to specify validation rules "in a very abbreviated fashion," the vendor explained.

Common Logic "is at a level above present compilers" and is available to all program types, Century Analysis continued.

Since Neat/3 is the output of the Pass/3 processing, the analyst always has the option of coding directly in that language if he is unable to define his problem within Pass/3's facilities, the company added.

In addition to producing source programs, Pass/3 also develops documentation, apparently subject to user specification. One possibility cited by the vendor was the creation of the operating instructions for the program being developed.

The generator requires a 32K Century 101 or larger machine, although the generated programs can be run on any Century on which they fit, including the 50, Century Analysis said.

There is no initial installation charge.

Century Analysis can be reached through P.O. Box 880, Concord, Calif. 94522.

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NCR 'Scholars' Now Complete

DAYTON, Ohio – With the availability of modules for test history evaluation and academic history, NCR has released the final pieces of its School Automated Records System (Scholars) for student records management.

Scholars now includes eight modules. The data base and control modules are required elements of every system because they provide basic services and build and maintain the single data base used by the six functional modules, an NCR spokesman explained.

The application modules include student scheduling, grade reporting, optical scanning for test scoring and other bulk data entry functions, attendance reporting – all of which were previously released – and the two latest modules.

As integrated elements within Scholars, the test history evaluation and academic history modules are said to interact with the other modules.

Among reports produced by the academic history module are student profiles, class rankings, honor rolls, transcripts and permanent record labels.

The test evaluation module provides scoring for both commercial and teacher-made tests, plus a variety of analytical reports for teachers, counselors and administrators, NCR said.

The software itself operates on any NCR Criterion or Century CPU with 32K or larger memory; it can also be run on NCR's Century 8200 mini, he said.

Scholars software is subject to a monthly license fee of $80 but users may elect an annual fee of $850 or a one-time license charge of $12,500, the company said.

NCR is headquartered at 17th and K Streets, Dayton, Ohio 45479.

'IFPS' Runs Financial Models, Report Generation on Cybernet

MINNEAPOLIS – Financial planning and analysis software is now available through the worldwide Cybernet time-sharing networks of Control Data Corp.

The Interactive Financial Planning System (IFPS), developed by Execucom Systems Corp. of Austin, Texas, includes a user-oriented report generation system designed to help business executives evaluate financial situations, CDC said.

IFPS handles such activities as long-range strategic planning, intermediate and short-range tactical planning, capital budgeting, resource allocation and cash-flow analysis, according to the firm.

Because the language consists of English-like statements, the user does not need programming skills to use IFPS, the vendor emphasized.

IFPS offers spread-sheet analysis for such reports as profit-and-loss or cash-flow forecasts and risk analysis for use in calculating probable results of new product introductions, marketing strategies, acquisitions or mergers.

A "what-if" command is available with either technique, allowing the user to try different variables and learn which factors are most critical to the problem, a spokesman noted.

On the interactive Cybernet networks, a small model may be built and solved for less than $5, with complex models rarely costing more than $50 to build and solve, CDC said.

CDC is at P.O. Box 0, HQW051, Minneapolis, Minn. 55440.

Software Course Set For Hardware People

MOUNTAIN VIEW, Calif. – A self-teaching course designed to meet the needs of hardware designers learning software has been introduced by Creative Computer.

"Microcomputer Programming with Modu-Learn" is said to cover the spectrum of microcomputer software topics. Much of the material presented has only been available in a limited number of intensive programming courses and seminars, the vendor claimed.

The course is divided into 10 self-teaching lessons, with additional sections of information on computer architecture, operation and software systems. Each lesson is divided into sections on software concepts and implementation.

Theory and Practice

The concept sections discuss the theory behind software techniques or problems that are commonly encountered in microcomputer applications; the implementation sections then show how to put theory into practice on real microcomputers, a spokesman explained.

Throughout the course, emphasis is placed on understanding the hardware/software relationships that must be considered when designing a microprocessor-based digital system, the spokesman said.

The Modu-Learn course is distributed in a sequence of five shipments, with the first shipment available in 30 days. The unit cost is $49.95, with quantity prices available.

Creative Computer is at Suite 4, 1901 Old Middlefield Way, Mountain View, Calif. 94043.

Version of 'Mark IV' Adapted to VS/9 Use

WOODLAND HILLS, Calif. – A version of the Mark IV system from Informatics, Inc. is now available to users of the VS/9 operating system on the larger Univac Series 90 CPUs equipped with virtual storage facilities.

Mark IV supports a variety of utility and application-oriented DP functions including the handling of file and data base maintenance, retrieval of specified data, computations, report preparations and output file creation, Informatics said.

It is considered a nonprocedural language and, according to its proponents, is one of the highest of the high-level languages that exist today. Mark IV is the only software product of its type currently available to VS/9 users, Informatics claimed.

Mark IV is available for one-time costs ranging from $21,000 to $37,000 depending on options selected by the individual installation, a spokesman said from 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

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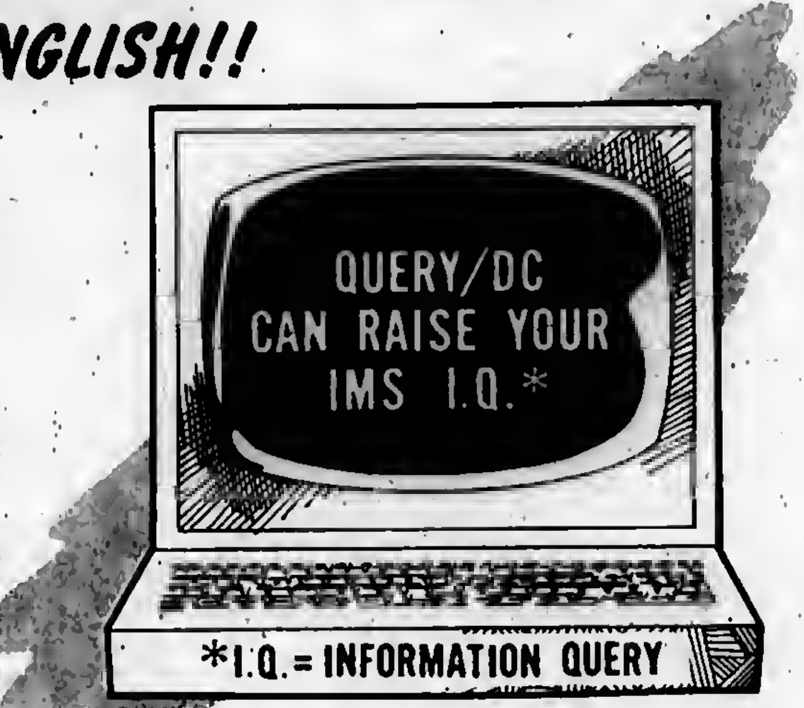

- Process queries from multiple terminals.
- Route output to user's terminal, remote terminals or printers.

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A systems analyst says of his firm's new QUERY/DC capability: "After an in-house QDC class by Informatics, one of our users produced the exact reports he wanted. We had tried for five months to do that job in Cobol. Now he prepares his own IMS queries with QDC in less time than it would take to explain his problem to me."

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Data Errors Can and Must Be Controlled, Users Told

By John P. Hebert
Of the CW Staff

NEW YORK – Incorrect data is a serious impediment to effective use of computerized data bases, but conventional approaches to the design and implementation of automated error-detection systems are inadequate for large and complex bases, according to Michael Hammer of MIT's Laboratory for Computer Science.

Suggesting a "structured" approach to error detection, Hammer emphasized at a recent conference here the need for users to adapt the approach to changing requirements in different error situations.

First, the user has to recognize the limitations imposed by the costs of error detection – which are often prohibitive – and realize, in any case, mistakes will be made that cannot be found, he said.

Secondly, an organization can usually exist with moderately correct data; a controlled amount of errors have to be accepted, depending on the critical degree of the area where the errors occur, he said.

He stressed the importance of "error detection not being an end in itself." Once errors are found a solution to correcting the source of the incorrect data must then follow.

Errors Differ in Type

To help discovering the errors, the user should be aware of the different types of errors in the data base and be able to identify them, Hammer said.

The simplest type of error is an individual value which is inappropriate for the field in which it is contained. Moving deeper into complexity, he said, "look for inconsistencies between different fields of the same record.

"Also look for an inconsistency between the fields of one record and the fields of related records.

"Finally", he advised, "look for a global pattern that is out of order in some set of records or in the data base as a whole, rather than for individual errors."

Other "gray areas" are obsolete data and missing data. In all of these instances, a developing trend of data out of the norm over time may be found, he said.

Whatever type of error is found, the degree of error must then be decided and appropriate action taken, according to degree of importance.

Areas in which to concentrate efforts that help avoid mistakes might include data entry, where operator training and incentives may help to prevent erroneous data; forms design; system workload; and the underlying file design – "separate the volatile and nonvolative data, for example," he said.

In a separate presentation in the same session, Grayce Boothe of Honeywell Information Systems warned that rapid technological change currently dictates against attempting to combine a distributed processing system with a distributed data base.

Although distributed systems can now be built well, she said, the distributed data base is not as well developed in concept or in practice. And the advantages usually are outweighed by the disadvantages.

The advantages of a large, distributed hierarchical system, cited by many users, are improved performance and response; control through local management; improved availability and reliability of data; and often, decreased communications costs, Boothe said.

Critic Disregarded '74 Cobol Features

By Ken Seidel
Special to Computerworld

The anti-Cobol article by Tom McSloy, capped by its sensational headline, "Trying New Techniques with Cobol Called Hopeless" [CW, May 31], must not go unanswered.

First, it appears no knocker of Cobol is aware of the Ansi 1974-Standard's Interprogram Communication features; these allow a user to divide the programming task into independently compiled subprograms. Parameter passing is accomplished by the construct:

CALL subprogramentry USING parameterlist (e.g., CALL "XYZ" USING PARM1, PARM2.).

In a subprogram, the linkage section provides a description facility for the passed parameters (actually the addresses of parameters are passed, enabling the subprogram to access the caller's data).

Second, how can supposedly knowledgeable critics allege Cobol lacks "disciplined" constructs such as IF . . . THEN DO . . . ELSE DO . . . "? The plain fact is that Cobol *does* possess this type of logic, and criticizing the fact that PERFORM is not identical to DO block is pretty silly when the same general capability is obviously there.

In fact, an unbiased critic would realize the clarity of control can be enhanced by simply writing IF condition PERFORM section-name-to-handle-it ELSE . . . , then embedding a complicated and heavily nested DO block in the midst of the statement after the condition.

Then too, nested IF statements are also available in Cobol, if one so desires. (Let me also note here that THEN is no longer an official reserved word.)

Really, it is absurd for a critic who does not have practical experience with a particular language to hole up in his private tower and castigate that language, ignoring its merits and its particular design assumptions. As an example of this, I cite McSloy's plaintive carping that periods are critical to Cobol sentence structure.

Is not the semicolon equally critical to the construction of a PL/I program? And is not Fortran's reliance on C in column 1 an equally arbitrary thing for that language?

As to McSloy's claim that no macroprocessor exists for Cobol, it appears he is unaware of a large commercial market thriving in support of Cobol. Information Management, Inc. of California bases its entire marketing philosophy around managing the Cobol programming environment (the biggest of them all) and offers products and services of just the kind McSloy suggested cannot be had. Other companies are active in this marketplace, too.

Seidel is president of Seidel Computer Associated, Inc. of Fallbrook, California, which is engaged in implementation of Cobol compilers.

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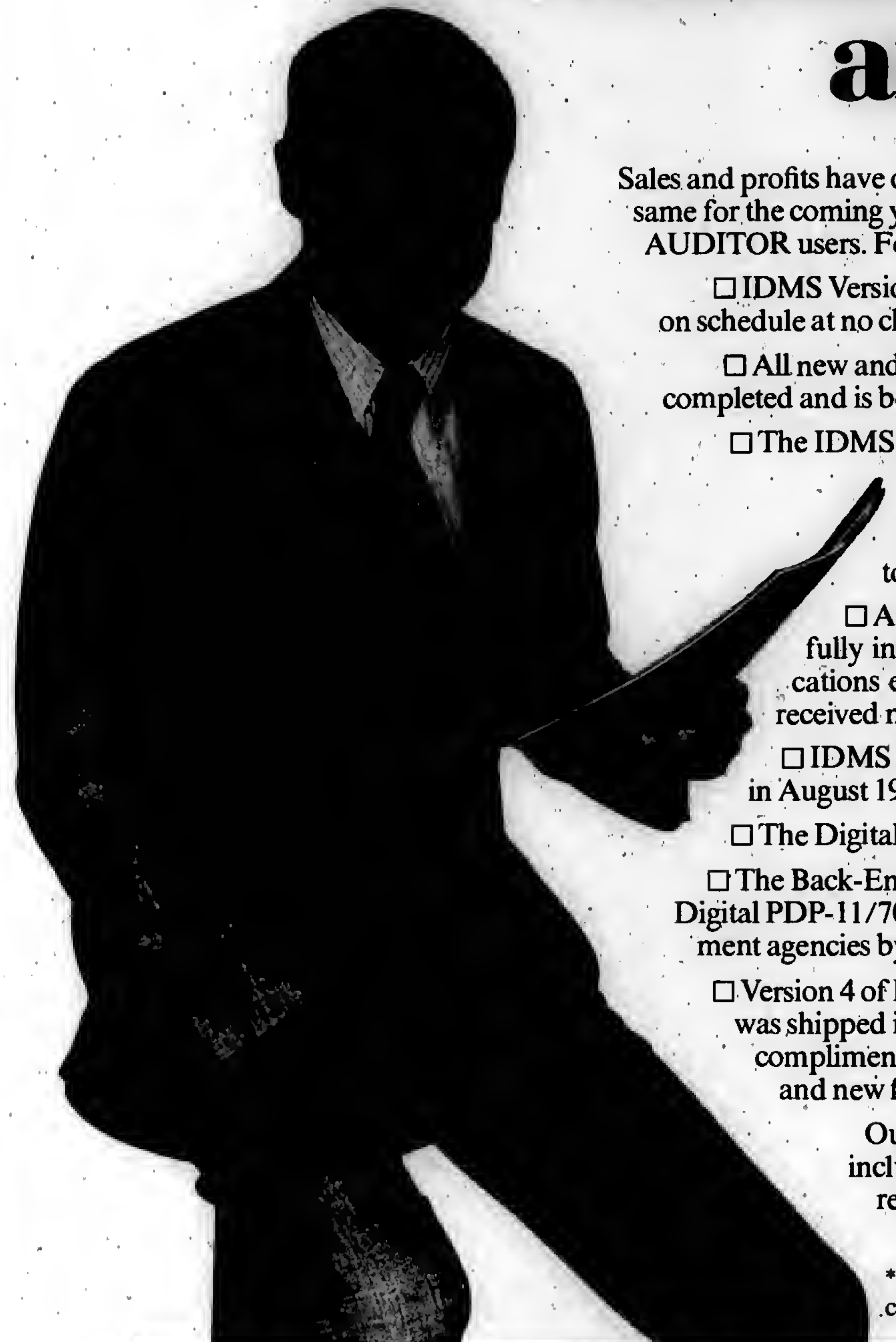

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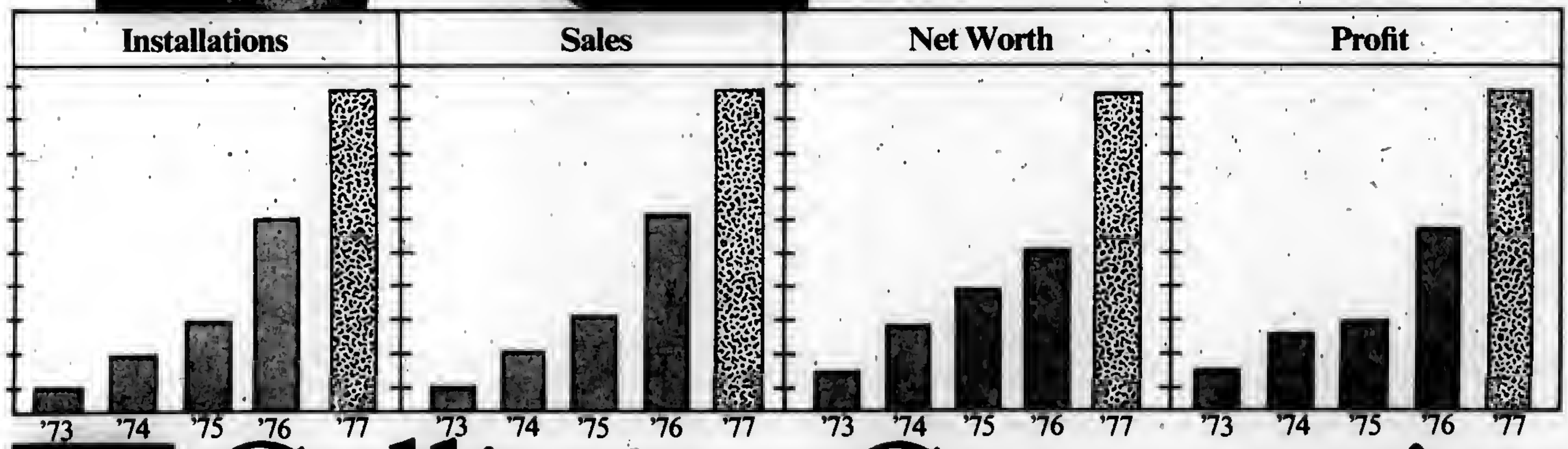

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Structured System Design More Vital Than Language

By Kenneth T. Orr
Special to Computerworld

If you leave them alone, certain arguments will go away. Unfortunately, some require repeated discussion, and one of these is the question of the relation of "structured programming" to programming languages.

Concepts and Techniques

I spend a great deal of my time going around the country telling people that "structured programming" is a way of looking at a problem, not a coding technique. I am particularly distressed, therefore, to see articles like the one by Tom McSloy [CW, May 31] which seemed to indicate that, unless the entire world immediately recognizes the futility of programming in anything but PL/I, we're doomed to poor programming forever.

At last count, we at Langston, Kitch and Associates found people doing structured programming in Cobol, Fortran, Algol, PL/I, Assembler, APL and, of all things, RPG-II.

However, despite protests to the contrary, Cobol has turned out to be a very hospitable language for doing structured programming based on *structured systems designs*. What is critical in taking advantage of the new technologies is an appreciation of logical, structured design.

If one attacks a problem logically and with the right design tools, the language used to code the problem becomes considerably less important.

For some time now, we have been employing an approach called "structured systems design," which is based on our own work, on structured programming and on the work of Jean-Dominique Warnier in France. It works with or without GOTOs or local variables or a macro facility. It does require, however, a thorough job of logical analysis and design.

No doubt we will see in the future the evolution of new languages for programming which will be aimed specifically at structured programming. And no doubt they will be somewhat different than Cobol is today (or PL/I for that matter).

However, to make the claim that structured programming in Cobol is hopeless does nobody any good, not even those who think PL/I represents the wave of the future.

The problem of whether programming language A vs. programming language B is better for the new techniques is much like the importance of car design on safety. If I go out to buy a car, a foreign car dealer which can demonstrate its automobile is significantly safer than others because of special design features can sell me a car.

And yet we all know the most significant safety device in an automobile is the driver.

I have the opportunity to see a wide variety of lousy programs as I travel around the country. My students often come up to me and say something like, "You won't believe this code," which of course is a program they have to maintain.

My experience is that there is damn little difference between lousy programs written in Cobol and lousy programs written in PL/I.

In fact, one can even be trickier and therefore lousier in PL/I than in Cobol. Moreover, the fact that PL/I has the ability to logically nest conditions sanely doesn't mean PL/I programmers are apt to use that facility or the DO WHILE facility – or the Macro facility either.

But while the programming language used doesn't seem to be highly correlated with good (or lousy) programs, the underlying design does. As a result of structured systems design and programming descipline, I've seen more excellent programs in the last two years which run correctly the first time than I have in the previous 14 years using traditional design and coding techniques.

Orr is director of advanced sytems for Langston, Kitch and Associates in Topeka, Kan., and a lecturer and writer on software and systems design.

Even PL/I Carries No 'Good Program' Guarantee

By Richard J. Weiland
Special to Computerworld

It is distressing to see a consultant of Tom McSloy's caliber miss so much of the point with regard to doing structured programming in Cobol as he did in "Trying New Techniques With Cobol Called Hopeless" [CW, May 31].

In the first place, choice of a language has very little to do with structured programming. Thinking through the transformations that produce desired results, developing a functional design and organizing the flow of control have nothing much to do with whether one is going to code in Cobol, PL/I, Fortran, Assembler or Lisp.

While it is certainly true that some languages lend themselves more directly to encoding the control structures that have been fairly generally agreed upon (i.e., concatenation, alternation, iteration), anybody who can't figure out how to implement a DO WHILE loop in *any* language better go back to school.

And the unfortunate fact is that programs written in PL/I (which does so lend itself) are typically as crummy and unstructured as those in any other language. Go look at the code on somebody else's desk for ready examples.

Reasonable use of DO groups, to say nothing of reasonable use of BEGIN groups (to define data locally) is about as common as amicable lunches between the IBM and Justice Department legal staffs.

Obviously, this is not to say that one can't write handsomely structured PL/I, just that not very many people do, alas. Simply picking PL/I for coding is not enough.

Features Not Missing

Second, the 1974 ANS Cobol specifications include most of the features McSloy mourns as missing. (That standard must be one of the industry's least read books.)

A reasonable collection of vendors have made good progress in making these features available, if they did not already exist as extensions to their ANS 1968 Cobol compilers.

Let me not get too far into a Cobol vs. PL/I shouting match. Nobody is going to argue that Cobol is flaw-free or particularly graceful.

But for every one of the Cobol defects McSloy cited, there is either an exceedingly simply way of getting around the problems or an equally obvious wart on PL/I to match. The line of candidates for sainthood among programming languages is remarkably short.

It is hard for me to take McSloy's "hopeless" epithet for Cobol very seriously. Faults there are, problems there are, fudges occasionally are needed in using Cobol.

But there are just too many people and organizations around these days successfully doing structured programming in Cobol for anyone simply to throw up his hands at Cobol and hope it will go away.

Weiland does structured programming in a variety of languages for SEI Computer Services of Chicago, and lectures on "How to Teach Structured Cobol" for Yourdon, Inc. of New York.

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First Memorex 1377 User Reports Units Working Fine

By Ronald A. Frank
Of the CW Staff

DALLAS – "All we did was unplug the IBM 3277 and plug in the 1377 replacement." It was the first time the 1377 had every been hooked up to a CPU in a customer environment and it worked fine, according to Phil Schilt, director of data services for Omnis Corp.

The CRT terminal Schilt described was the first installation of the Memorex 1377, a plug-compatible replacement for the IBM 3277. The 1377 operates behind the standard IBM subsystem controller and therefore requires no changes to the rest of the configuration, Schilt said.

Omnis Corp., the DP arm of Dallas-based Sammons Enterprises, Inc., has also found other configurations in which the 1377s will operate. One of the CRTs acts as an alternate system console device for the firm's 370/158 at a price about 34% below the standard Model 158 console, Schilt said.

The Memorex terminals will also be used as data entry terminals in the company's planned IBM 3790 system, he said.

The 1377s are described as completely transparent and IBM representatives can run standard Olteps diagnostic routines even without switching the non-IBM CRTs out of the various configurations, Schilt said.

Omnis currently has about 12 of the 1377s. Some operate in local mode to the mainframe behind an IBM 3272 controller; others, installed at an Omnis location several blocks from the 370/158, are interfaced to an IBM 3271 controller and transmit data at 7,200 bit/sec over private lines using data sets supplied by International Communications Corp.

This data is transmitted to a Memorex 1270 terminal control unit attached to the CPU. As part of a system upgrade to distributed processing, Omnis is planning to replace the 1270 with a Memorex 1380 front end, Schilt said.

$40/Mo Less Expensive

Addition of the 1377 terminals has saved his company about $40/mo per terminal compared with IBM 3277s and, in the course of a year, Schilt said he expects to save between $12,000 to $15,000.

The Memorex units were installed under a two-year lease plan which provides price protection while the 3277 is available only on a month-to-month basis from IBM, he said.

The CRTs are used in a claims processing application which Omnis does for its affiliated company, Reserve Life Insurance Co. The policyholder data base contains information on about 1.1 million accounts. The CRTs are operating under CICS/VS, which runs on the Model 158 in 1.5M bytes of virtual storage.

Seven Days to Two

Accident and health policy claims are called in to the Omnis DP center here, where information is entered into the 1377s by operators taking the phone information. The operators verify the policy data and then check to see that no previous claim has been filed.

Periodically during each day, claims checks are issued to policyholders. The terminal inquiry system is expected to reduce the claims-processing cycle from the present seven days to two days, Schilt said.

The 370/158 runs under OS/VS2 Release 1.7 and a memory upgrade of 1M byte using Memorex add-on storage is to be implemented soon, he said. In addition, Schilt noted, Omnis will install the Mod III upgrade from IBM which should provide an "8% to 11% improvement" in CPU throughput.

Speed No Stranger at Company Where Net Goes Up in 90 Days

By John P. Hebert
Of the CW Staff

MEMPHIS, Tenn. – Everything that happens at Federal Express Corp. happens very quickly and installing an interim computerized terminal communications system seems to have been no exception to Federal's ability to compress time on company projects.

It took 90 days for the airline, which specializes in the overnight, door-to-door transportation of small packages and time-sensitive documents, to set up Datacomm a point-to-point terminal communications system.

The real-time system helps Federal keep track of shipments, flights and aviation weather for its 32 Falcon fanjets, 11 leased airplanes and a surface fleet of more than 600 vehicles, according to Charles Brandon, Federal's vice-president of operations planning.

Three-Month Project

The three-month race to implement the system included training all personnel who would work with Datacomm, setting up a mainframe here, tying in almost 90 intelligent communications terminals and linking this segment of the system to a high-speed airline message-switching computer system in Los Angeles, Brandon said.

Datacomm is presently composed of almost 100 IBM 3767 models 1 and 2 keyboard line-matrix printer terminals operating at 40- and 80 char./sec. Messages are received by a 32K-byte IBM System 7 CPU working in conjunction with a card reader, Philips-type cassette and a Teletype, he said.

The terminals send and receive data from the Memphis mainframe over six synchronous dedicated lines at 1,200 bit/sec; there is one 1,200 bit/sec line for in-house communications between the mainframe and the Teletype, he said.

Federal's "first step" at computerized networking is linked to an IBM 360/65 host computer at Mutual Computer Services (MCS) in Los Angeles, where Federal's messages are switched under an airline control program, Brandon said.

This link is through ICC/Milgo synchronous modems and a dedicated 2,400 bit/sec line, which has dial-up backup capabilities in the event of line failure, he added.

Federal Express itself was started from scratch in April 1973, delivering a few dozen packages among six cities. The company now handles about 20,000 pieces of freight weighing 14 or 15 pounds on the average daily, according to Brandon.

The company needs immediate communications among the 75 cities and corporate headquarters. "The communications network must be able to answer an inquiry or check the whereabouts of a shipment within minutes to meet the level of service customers expect," Brandon said.

Because the company has "grown like topsy" and still has "growing pains," it outgrew its TWX network because it was not fast enough and had no broadcast capability.

"We needed a way to get the computer flight plans out to the carriers and get things done quickly," Brandon recalled.

Even though a message from a 3767 terminal has to be routed through the System 7 in Memphis and then to Los Angeles and back through the 7 CPU again, "the response time is always under 3 sec and 1.5 sec is hardly unusual," he said.

Success Credited to Planning

The reason why Datacomm is so fast, Brandon explained, is because all the complex message-switching is performed on a much larger machine and the airline control program at MCS is a very fast program with a high-volume, fast rate of response.

Aside from the computer end of things, the system's installation "went so well because we planned the hell out of it. We were like the military when we developed it and had meetings discussing it every Monday morning," he said.

Hartke Hoping for Congress To Cut FCC Policymaking Power

FRENCH LICK, Ind. – The Federal Communications Commission's (FCC) trend toward new telecommunications policies "unratified by the Congress has been accelerating at an alarming rate," according to Sen. Vance Hartke (D-Ind.).

Speaking at the recent annual convention of the Indiana Telephone Association, Hartke said Congress will have to deal with the issues raised by the Consumer Communications Reform Act. Hartke is a major sponsor of the Senate version of the proposed legislation [CW, March 22].

"My mail indicates that many private citizens are awakening to the possible impact [of competition] on their telephone rates and services. Some have communicated with me directly – others are speaking through organized consumer groups.

"And, finally state, local and Federal government agencies are considering their involvement in the debate," Hartke said.

"The emergence of the computer and its dependence on telecommunications to reach distant terminal stations" could not have been anticipated when the Communications Act under which the FCC operates was first drawn up in 1934, he said.

"The FCC has had to make very difficult regulatory judgments which were, in fact, new policies. Thanks to the alertness of the telephone industry, I think Congress will get to the issue of appropriate regulation of telecommunications carriers" before it is too late.

"We have a good chance of getting there before an irreversible regulatory policy has been locked in concrete," Hartke said.

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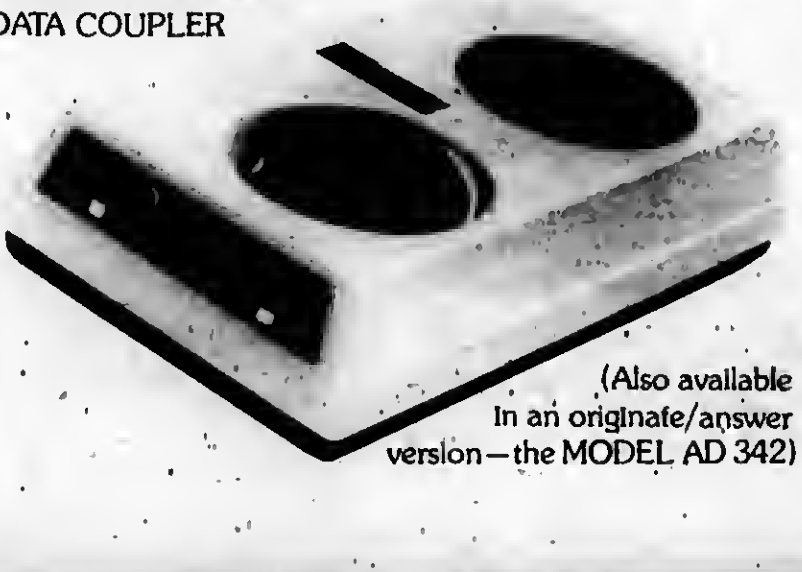

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Front End Eases Processing Load for CPU in NBS Net

By John P. Hebert

Of the CW Staff

GAITHERSBURG, Md. – The National Bureau of Standards' (NBS) Computer Services Division faced a processing overload when it switched from a batch-oriented service center to a time-sharing service bureau two years ago.

But the division was prepared for the change – it knew it would need a larger front-end processor to help its Univac 1108 mainframe handle the increased processing requirements inherent in a large communications network.

The division believed the ideal front-end processor would have to handle a 200 kbit/sec workload with peaks of 250 kbit/sec from the NBS laboratories alone, according to Ray Shaver, chief of systems operation.

These "fairly ambitious specifications" were compounded by management's requirement for 99% uptime from any unit installed, he recalled.

"We needed something to handle the increased communications workload and be flexible enough to grow" to meet the anticipated load, Shaver said.

Two Choices Available

The products of vendors, Univac and Omnus Computer Corp., filled the requirements set forth by the center. Omnus made a lower bid to do the job with its Omnus-1/CU and, as required by government procurement policy, was chosen.

The Omnus equipment was installed in July 1974 and finished acceptance testing in September with over 99% uptime.

"We were way ahead of ourselves when we opted for the Omnus," Shaver said.

Working through the Omnus-1/CU, the Univac 1108 CPU provides computer support for the NBS laboratories, which use it for scientific computation and engineering problems; support for NBS administrative work and some government data bases; and work for government agencies, including the Department of Transportation, he said.

And because of the government's policy of encouraging the purchase of the lowest bidder's equipment, there is "a lot of foreign hardware hanging off the 1108" – Ampex, Inc., California Computer Products, Inc. disk drives and Storage Technology Corp. tape drives.

"It's not too bad a situation because we do our own hardware maintenance," Shaver explained.

Terminals tying into this computer system are "scattered all over the place," Shaver said.

Melange of Terminals

There is a mixture of remote batch terminals emulating Univac 1004 protocols: Harris Cope 1200 and 1600s, Digital Equipment Corp. PDP-11s, Data 100 units, Remcom Systems, Inc. devices and "even a Singer terminal."

In addition, the Omnus-1/CU handles true Univac DCT 1000s, DCT 2000s and Univac 9300 batch terminals.

The 1004 emulators are centered for the most part on the East Coast, except for a 9300 in the NBS Boulder, Col. labs, he said.

Interactive terminals tied into the front-end processor emulate Teletype equipment and communicate in Ascii at 110-to 1,200 bit/sec on dial-up phone lines.

The interactive terminals used include the Texas Instruments Corp. Silent 700 series, Omron CRTs and a Tektronix, Inc. 4014 graphics terminal used for plotting, Shaver said, adding NBS expects much growth in the interactive graphics terminal area.

Modems and Data Sets

Modems utilized by the NBS computer center and at the remote sites include Vadic Corp. card-type units working at 300 bit/sec for interactive applications and at 1,200 bit/sec for dial-up purposes on the asynchonous side.

For synchronous communications, there are Bell 208B modems for 4,800 bit/sec dial-up applications and Bell 201As for 2,000 bit/sec dial-up applications; ICC/Milgo data sets operate at 4,800 bit/sec for dedicated applications.

Additionally, the center has a line driver from Penril Corp. for 9,600 bit/sec local communications between buildings here, he said.

'No Question'

"There is no question the front-end processor takes the load off the mainframe – it handles all terminal protocols and the detailed communications work.

"Without It, the CPU would be so overloaded it would die. Communications is a killer for the 1108 unit processor because it could interrupt for single characters," Shaver said.

Echoing Shaver, Ed Barkmeyer, a computer specialist in the Computer Services Division, said the Omnus frontend's advantage is exactly that – it takes the interrupt load off the 1108.

"The CPU must service all of the time-sharing interface interrupts on characters – it's a fairly sizable weight on the 1100 and the supporting minicomputers."

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NEW YORK – Com/Tech Systems, Inc. has upgraded its Secre/Data 102 series of data scramblers to provide 10 billion code combinations.

The Secre/Data Series H102 scramblers, which feature automatic cipher synchronization, allow users to select the code combinations by 10 thumbwheel switches.

The scramblers work with asynchronous communications lines operating at speeds up to 9,600 bit/sec and with synchronous lines carrying data at speeds up to 19.2 kbit/sec, a company spokesman said.

Interfaces for transmission rates up to 50- or 56 kbit/sec are also available, he added.

The automatic cipher synchronization feature is transparent to the computer system interfaced and is said to preclude the ability to obtain "key" information, even if known messages are transmitted.

The data scrambler is available for half- and full-duplex lines. A half-duplex model for synchronous communications with timing supplied by the user costs $1,750, the spokesman said.

Prices for other models in the H102 Series can range to $3,000, he added from 44 Beaver St., New York, N.Y. 10004.

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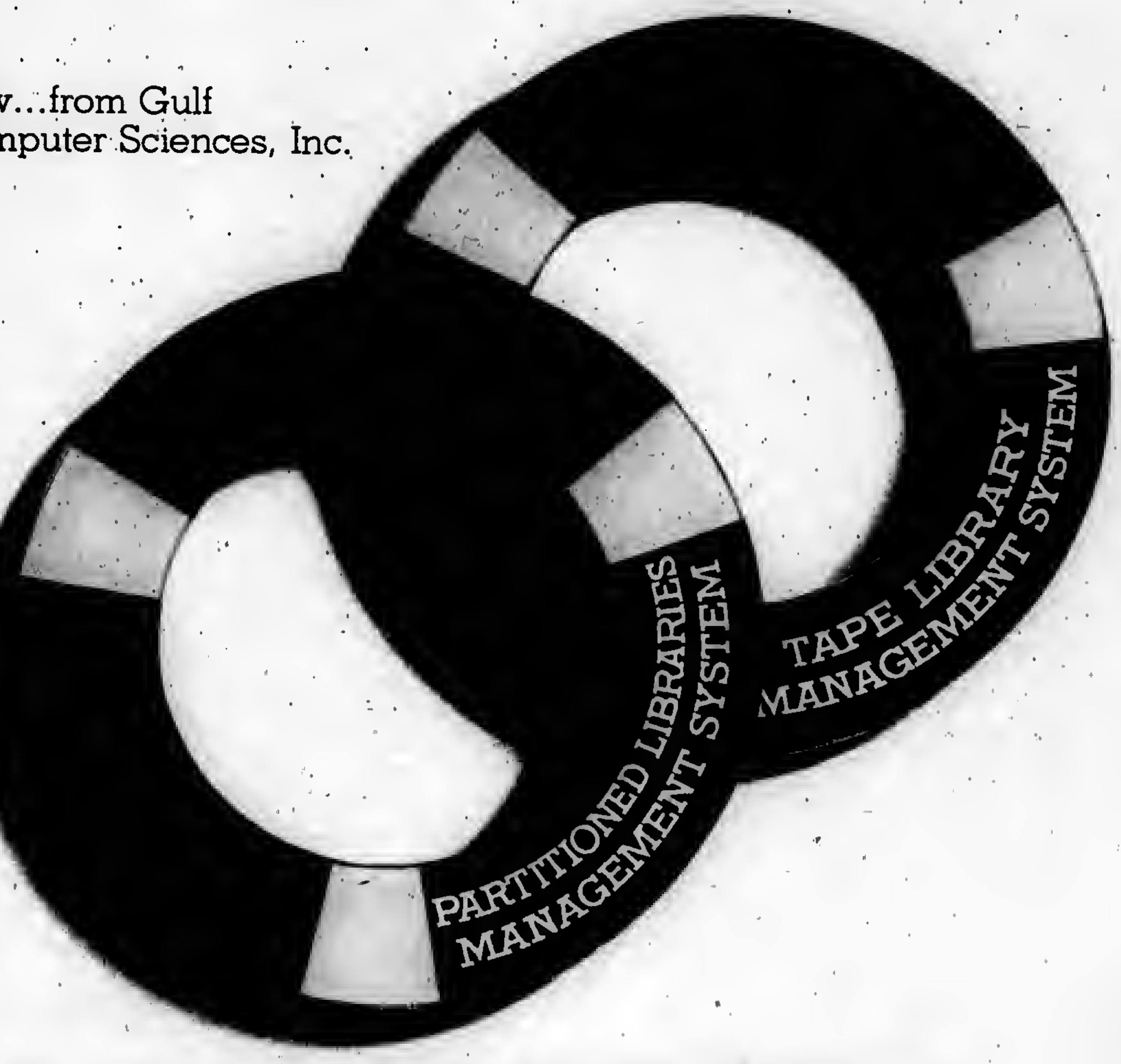
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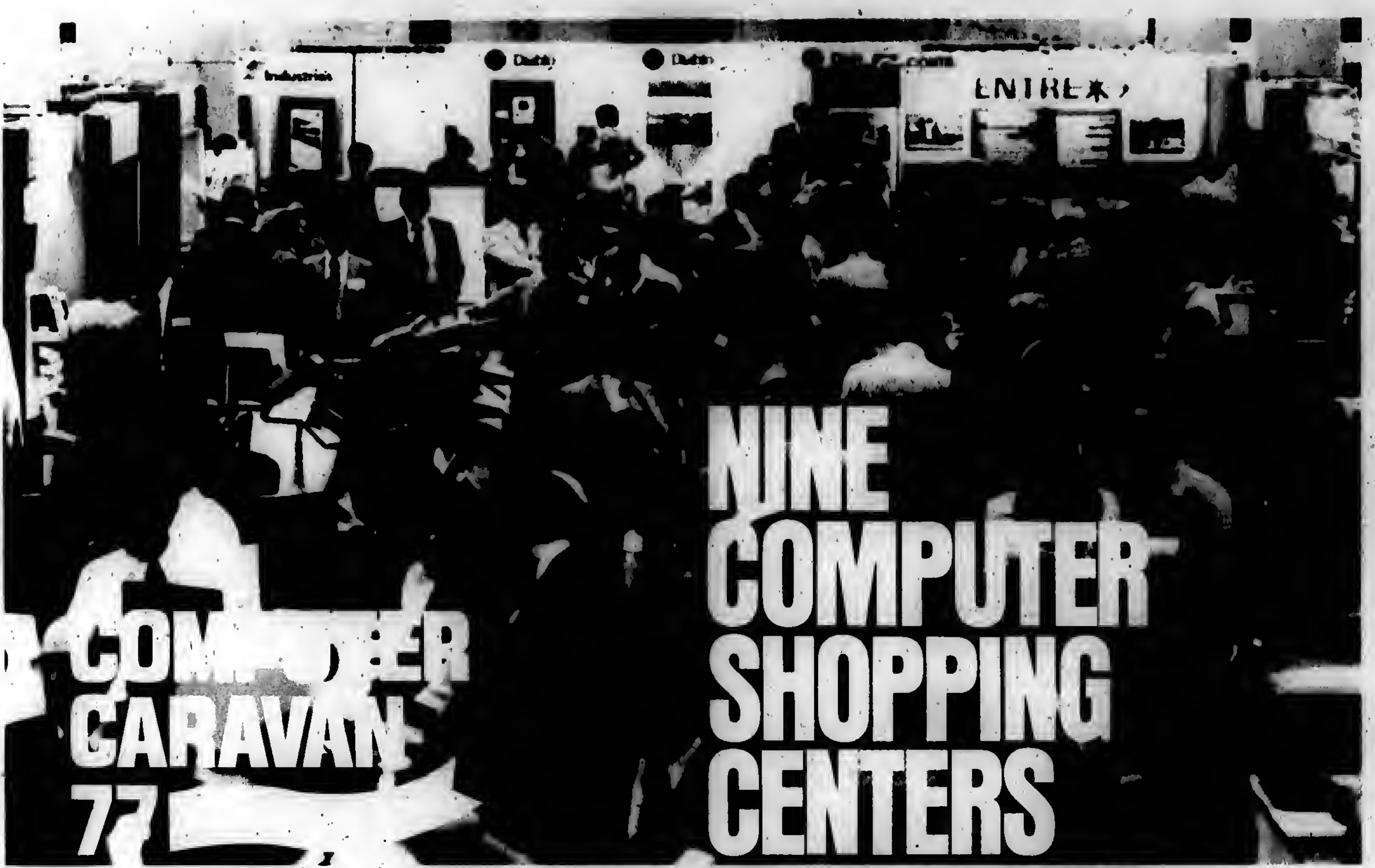

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PTTs Called Virtual Monopolies

Public, Private Nets Seen Vying for European Users

By John P. Hebert
Of the CW Staff

NEW YORK – The interaction between public and privata data communications networks in Europe will influence the market structure of future information systems there, according to Louis Pouzin of France's Institut de Recherche d'Informatique.

There is no equivalent to the U.S. Federal Communications Commission in Europe, Pouzin said at a recent conference here. Instead, each country has a postal telephone and telegraph (PTT) authority which not only makes the regulations, but is that nation's common carrier of data communications facilities.

The body best qualified to formulate standards for European data communications networks is the PTTs, in the opinion of Phillipe Picard of the French PTT.

The European PTTs, which are in effect monopolies, charge a flat rate of $2,400/mo for the use of communications lines plus an additional traffic charge of 25 cents per message/mo, Picard said.

"A monopoly implies rights, but it also implies obligations," he added.

There are three categories of organizations which could bring about standardization – users, manufacturers and the public communications carriers, he said.

Users don't have the power to impose standards, nor do small manufacturers of data communications products; the large manufacturers, Picard said, usually don't want to impose the power they have.

There are few private networks for dedicated purposes in Europe at present, Picard noted.

"The main problem with private networks," he continued, "is with getting approval of data communications equipment, especially that of complex equipment."

Private Nets on Increase

David Mann of the English firm of Logical Ltd. told conference attendees the number of private data communications networks is steadily increasing. This trend will continue unless there is a radical policy change from the PTTs, he added.

The demand for private networks comes from a number of different forces, according to Mann, including the need for better facilities and lower costs and a desire for more standardization and control in "total systems".

The PTT tariff costs are the greatest motivational factor in building a private network, in addition to being one of the big advantages of a shared network, he said.

In the future, changes in tariff structure to make shared networks more attractive will be evident, Mann predicted. The PTT's prohibition of such activities is no good because the PTTs cannot offer better service, he said.

Unfortunately, Mann said, because of PTT inadequacies of service offerings resulting in the increase of private networks, there is unnecessary duplication and more inflexible design.

This, in turn, is resulting in greater pressure for more coordination and standardization of data communications networks.

The private networks act as a catalyst for better service from the PTTs, which do not want to lose network subscribers, he said.

Another speaker on the antiregulation side of the fence described the shared network facilities of the Societe Internationale des Telecommunications Aeronautique (Sita).

The Sita network is a "unique animal"; it not only has the privilege of transmitting over international European networks for shared use, but it has to keep it, Sita's Pieter Kroneberg said.

"Do we (private networks) have the right to continue to operate the private networks and pay administrative bills but have the (PTTs) leave us alone with our own procedures?" he asked.

"I would say the government has a given right to say what standards will be imposed, but how far it should go on monopolizing private users is the question," he said.

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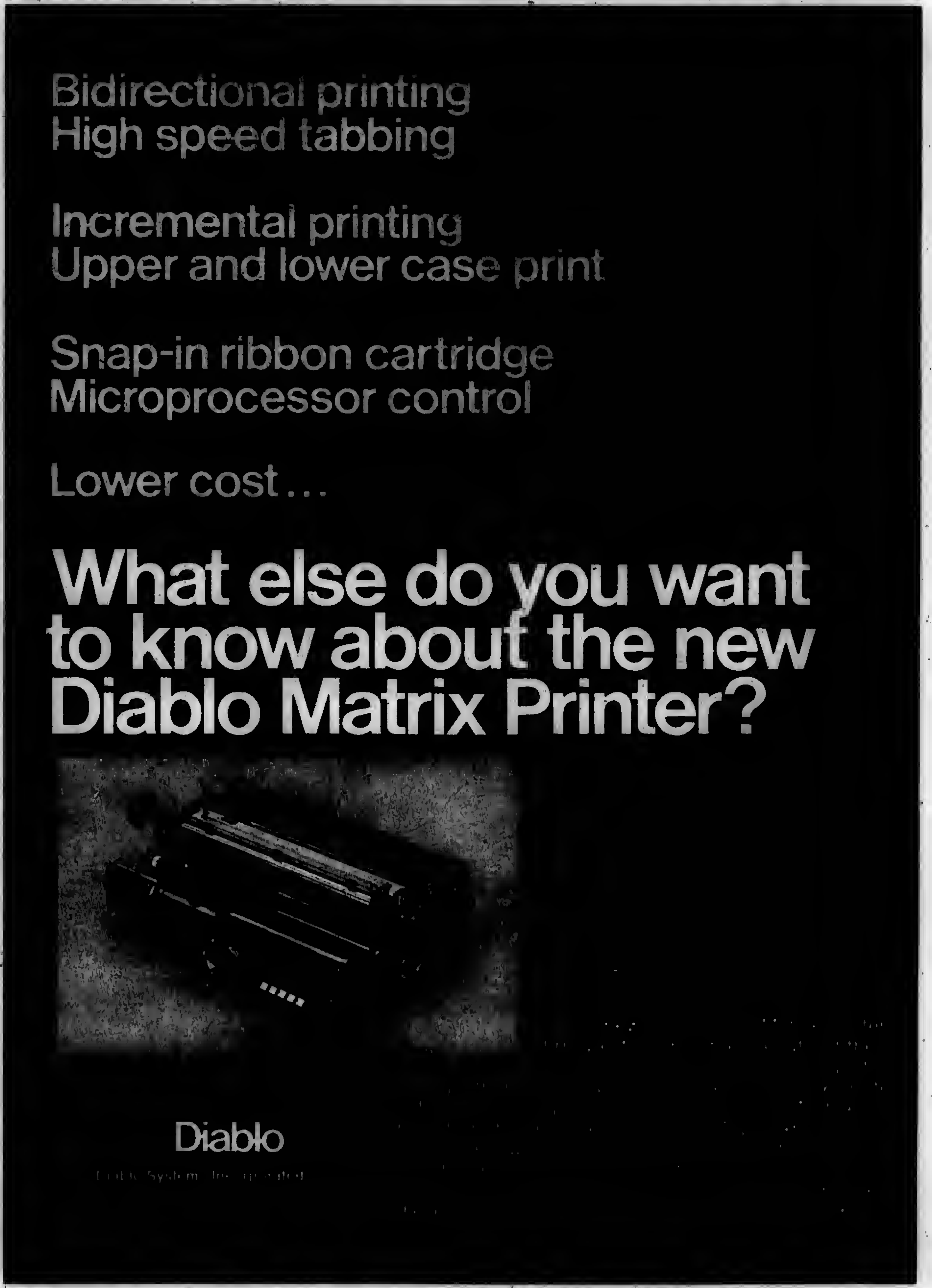

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A Computerworld Special Report JUNE 28, 1976

Can Aid Physically Handicapped

Man/Machine Interface Utilizes Human Brain Waves

By John P. Hebert
Of the CW Staff

LOS ANGLES – A team of researchers here has taken a step into the future by experimenting with a direct brain-to-computer interface.

Five years of experimentation with the man/machine interface which links a person to a computer system by utilizing the brain's faint electrical activity manifested on the scalp, has yielded impressive results, according to Dr. Jacques Vidal.

In some cases, experimental subjects have moved a visual object electronically through a maze on a CRT screen with up to 97% accuracy, he said.

The method by which this is accomplished is not to be confused with a person thinking an object through the maze: "It is not thought which moves the object, it is a mental set," according to Videl. head of the Brain Computer Interface project of the University of California at Los Angeles (UCLA) Computer Science Department.

Drawing a fine line between brain activity and thought, Vidal said he and the other researchers "trying to demonstrate a visual keyboard or light pen" where a "master" directs his gaze to a particular learned spot on a CRT screen, which acts as stimulus for the symbolic object.

A computer system decodes the associated brain wave activity, which then serves as a "command" to move the object, he said.

Beneficial Applications

The $100,000 per year experiment could have harmless and beneficial applications, Vidal said, noting some were concerned with the implications of the experiment.

"One application directly in mind," he said, "is in the case of cerebral palsy victims, where there is no motor control, but eye control. One can sense what the subject is looking at, " he said, but there is little communication beyond that point.

The man/machine interface can provide the motor link between this person and his surroundings, Vidal indicated. "Direct brain-to-machine commands can be of obvious practical importance in the case of dysfunction, saturation or emergency situations," Vidal said.

Asked whether he thought the interface might ever be used in dangerous situations, Vidal said, "nothing should ever entirely rely on it."

The U.S. Public Health Service indirectly provided the initial funding five years ago with money left over from another grant it had given to UCLA, the project head said.

Current support comes from the government's Advanced Research Projects Agency (Arpa) and also from the National Science Foundation.

A real-time computer link from the subject to the computer system forms an electrical one-way street with the human providing the input.

Visual stimuli, in the form of computer graphics on a CRT screen, provides the experimental subject with what Vidal called one side of a dialogue in a neurocybernetic loop.

During the experiment, the person sits in front of an Imlac PDF-1 CRT graphic terminal in a booth in a soundproof room, Vidal said.

A multifield display is presented to the person on the terminal screen for 100 msec with a red light spot serving as a reference point to direct the eye to a directional arrow. (Four arrows are used, representing up, down, right and left.)

These brief visual events are recorded on different positions on the retina , and the neural messages are sent to the visual cortex of the brain where they produce "ripples", he said.

The resulting "whole brain" neural activity is recorded for 300 msec by six small electrodes positioned on the scalp in exactly the same way electroencephalograms (EEG) are used to record brain wave activity.

The information is sent to UCLA's Xerox Data Systems F-930 computer system via a high-speed link passing through an audio amplifier which magnifies the faint signal between 500,000 to 1 million times, Vidal noted.

Related story on Page S/4.

Signals are processes in real-time, he said, with 80 samples of activity recorded for each of the five incoming channels. The resulting 400-dimension vector is reduced by a step-wise discriminational analysis to 10 best signals which are ultimately selected to represent a particular direction, he said.

The system then shows the subject the result of his brain wave activity and the subject learns that directing the gaze in a particular direction will correspond with a certain directionality.

The group of engineers and neuroscientists who developed the process have taken "average subjects" and brought them up to an 80% correct response rate in moving a symbolic mouse through a maze on the CRT screen, with little training, Vidal said.

Movement as Stimulus

The next research phase, he added, was to use movement as a stimulus.

Meanwhile, Arpa (which volunteered funding support for the project) is trying to promote similar experiments with aircraft simulators at the University of Illinois, Vidal said.

Asked what the possibilities of this further experimentation might be, Vidal said it could be used by a pilot-to-computer system link for evasive action, for example.

He said it could be used in emergency situations such as this, "but not to pilot the plane."

Regarding recent "misrepresentation in the press" Vidal stressed that the link is not directed from the computer to the human.

"It's directed the other way. We're talking about man controlling machines," he said.

Eliminating Keypunching, Hand-Written Documents Seen as Cost Advantages of Voice Data Entry

By John C. Collins
Special to Computerworld

Current designs for computer-based systems are strongly emphasizing a decentralized approach. The ability to allow a department of a total organization to have control of its own computer system and use it to more effectively run its part of an overall organization has come to the forefront in computer operations.

This decentralization has been made possible largely by technological progress with heavy emphasis on intelligent terminals, minicomputers and microprocessors. Since the combination of these capabilities allows the user more terminal capability for less dollars, the desired effectiveness of decentralization can be achieved in a cost-effective manner.

This present trend toward decentralization and the resultant dramatic increase in terminal use has pushed the cost of capturing and recording data input to a major portion of total computer system costs. The net result is an increasing awareness of the labor costs associated with data entry.

Electronic systems are now appearing which allow one to "talk" information directly into a computer with no intermediate keying or hand-written steps involved. Machine communications are simplified since the operator provides instructions in his natural language; spoken commands then are automatically recognized by the voice data entry terminal.

Our firm has developed and is delivering automatic voice data entry terminals. This terminal is about the size of an ordinary suitcase.

It consists of a small microphone headset, connected either by wire or wireless transmitter to a speech recognition terminal, where the words are analyzed and identified – depending upon an application – and may include a teleprinter, visual display, standard output to a computer, electronic control link to an electromechanical system or a combination of any such computer peripherals. The voice data entry terminal appears as a keyboard to any other host system.

Most applications require a vocabulary consisting of about 30 to 50 words, but the terminal can be made to handle 200 or more words or short phrases simply by adding to the modularly expandable memory of the speech recognition processor. The entire system is programmable so individual words can be changed at will and the whole vocabulary changed to another application by the user.

The only equipment located in the work area of an operator is a small remote control console which can include a visual display (automatic voice response is used in the case of wireless inputs from an operator entering data from many different locations). The speech recognition unit can be located up to 1,000 feet away and can be interfaced with an existing system using one of its channels.

Operating Procedure

When an operator is assigned to the voice data entry terminal for the first time, he must "train" the speech recognition system to recognize his voice by repeating each word in the vocabulary 10 times. The parameters of pronunciation for each word are then filed in the speech recognition processor's memory for later matching and identification. After this initial training, data is obtained from the operator; he need not retrain each time he uses the system.

Since the system stores the voice characteristics of each user, dialects, accents or different languages can be recognized by the speech recognition system. A Spanish-American operator for example, can train the system to recognize his "ocho" for the number "eight." Also, since the system analyzes speech features that are invariant to the day-to-day changes, head colds, sore throats or hoarseness normally will not hamper the recognition of the operator's speech.

By the use of a visual display at the operator's work area, an indication is given to him of what has been recognized by the machine. In this manner, the operator verifies a block of data entered for a particular operation by visually examining the display.

Should he detect an error, he uses a word such as "erase" and reenters the correct data. If the data on the display is correct, he simply indicates this fact and enters the data as a valid entry by saying the word "okay" or "go."

In normal data entry applications, information is entered in one of two ways. A turnaround document is key entered or a person records information at one station and passes it along to a key entry section which enters the data into the computer system. In some applications, there is minor handling of documents.

In others, because of the nature of the document which provides the basic information there is a requirement for the person who captures data or key enters data to use his hands to arrange, leaf through or select various pieces of paper for data entry.

Voice data entry is particularly effective in those applications where there is a handling requirement as well as key entry or those areas where one station manually records information and the second station key enters the data.

The use of voice data entry can, therefore, allow a person to use both hands and eyes to handle documents while simultaneously entering data directly into a computer system, provide voice data entry to the station that would normally record the data, eliminate the need to

(Continued on Page S/3)

On the Inside

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This special report was prepared under the direction of Editor E. Drake Lundell Jr. Cover art by Cynthia L. Kintzer.

Voice Entry Allows 20% Cut in Quality Control Staff

By Esther Surden
Of the CW Staff

CHICAGO – Using voice data entry for quality control at Continental Can Co., Inc. here has allowed it to eliminate in the neighborhood of 20% of its inspection force, according to Thomas H. LeMay, director of quality assurance for new products and methods for the Metal Operations Division.

The systems are being used by inspectors of pull-ring can lids, LeMay said.

Two other alternative means of accomplishing this goal were considered, LeMay said. The first, to record directly into a computer with a digital readout would have required new, expensive equipment. The second, which involved redesigning the measuring gauges, was tried and is working in several Continental plants, he added.

Uses Existing Gauges

Voice data entry was chosen for this particular application because it uses the existing gauges, and data could directly enter the system without changes in the way things were being done, LeMay continued. The inspectors could still use two hands to perform their complicated calculations, he added.

The voice system eliminated all the previously used data recording forms, reducing transposition errors, recording errors and the recording time which represented up to 50% of the inspection effort, he said.

The system at Continental has a two-line visual display that indicates the current state of the inspection process and prompts the inspector through his sequence. The upper line of the display indicates the current step, and the lower line displays the data which the inspector enters by voice command. The system was designed by Threshold Technology, Inc., a Delran, N.J. firm.

The operator is alerted with both a reject light and a "beeper" to indicate when an out-of-tolerance measurement is encountered.

The operators can also use various meters and gauges in the order in which they become available from other inspectors, according to Threshold. If an operator wishes to deviate from the normal sequence, it is possible to advance to another data entry field while preserving the current inspection step.

Summary Report

When all the data has been entered, the system prints out a summary report showing all the defects in the proper categories, Threshold said.

At Continental, the output is taken and entered into an IBM 370 for monthly analysis and summary, LeMay said.

LeMay saw a demonstration of the voice entry systems at O'Hare airport here where they were being used for baggage-handling purposes and thought he could use them for his application, he said.

The system is operating controlling 24 conversion presses in one plant. Continental is in the process of extending it to two more plants for all the variable control measurements of the beer and beverage lids, he added.

The Threshold 500 systems at Continental include 4K of random-access memory and cost $10,500 each. They are connected to a host Data General Corp. Nova minicomputer with 24K of core. The system was configured as a turnkey for Continental.

The system takes about a week to get used to, LeMay said. The inspectors are working on it within three or four hours, but it takes about a week for them to build up to speed. A video tape training film was used for the initial training, he said.

The system has been very reliable. The Threshold people have been down to take care of problems three or four times, LeMay said, but most problems are taken care of over the phone.

Speech Recognition Seen Offering Users Many Cost Advantages

(Continued from Page S/2)

manually write the information down and eliminate the key entry activity entirely.

In these situations, there are three major advantages of voice data entry:

- Improved Operator Productivity. Direct cost savings can result from either increased productivity or labor savings of subsequent keying operations which usually follow initial manual data recording. Indirect savings can result from elimination of training (since relatively unskilled personnel can use speech recognition systems). Usually the cost of generating a handwritten document in the proper format for a keying operation is three to four times the amount spent in the actual keying process.

The cost of voice data entry terminals reached the point early last year where the cost of the terminal equipment is less than the annual cost of a human operator. This has broadened the applications potential substantially to the point where productivity increases of 20% to 30% can economically justify voice data entry systems.

- Operator Interaction. When speech recognition systems are employed in data entry systems, all the advantages that can be realized from source data capture are incurred. Only a single individual is responsible for the accuracy of the data being entered since no intermediate operators or steps are required.

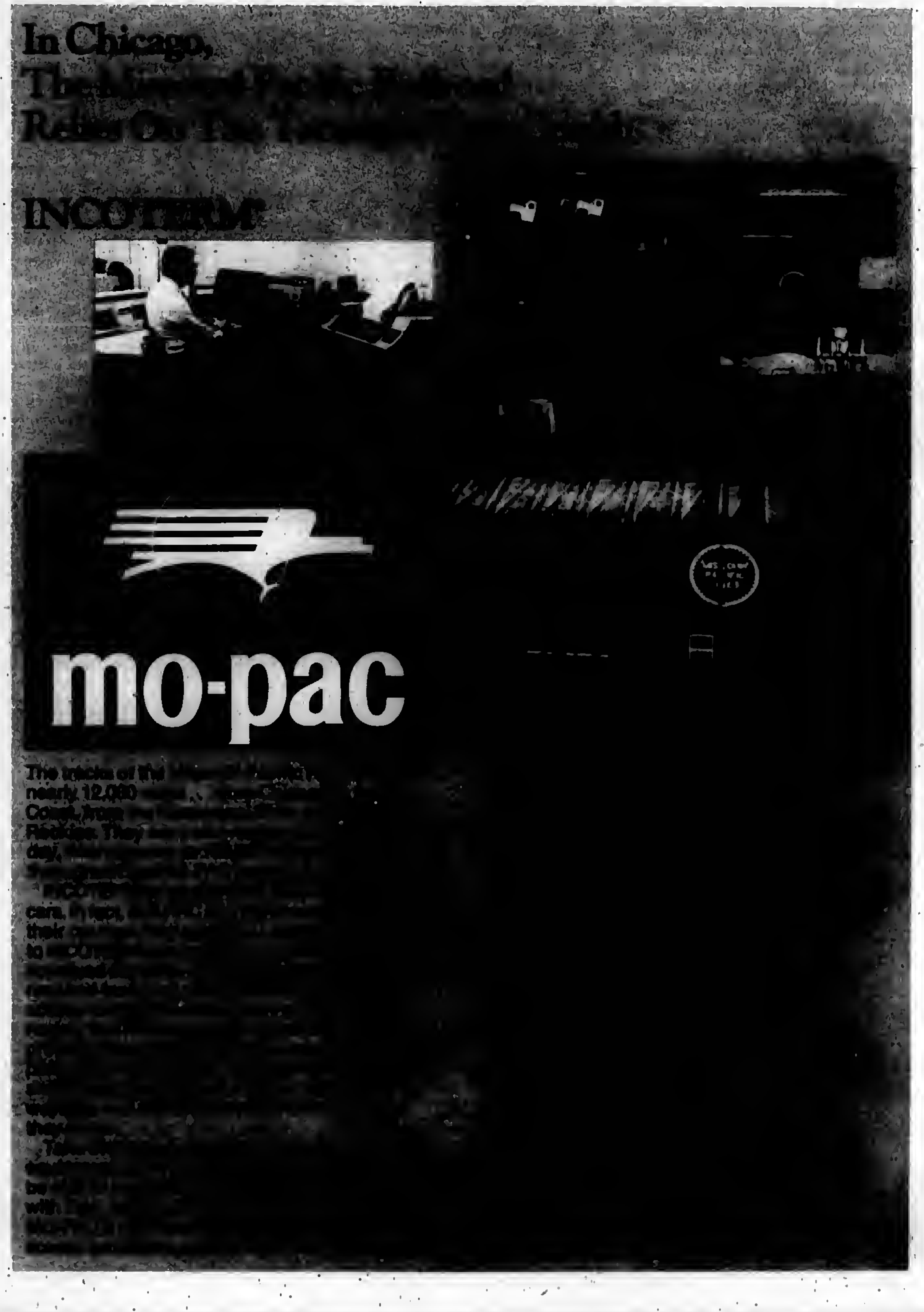
Real-time feedback, either visual or aural, can guide the operator through a complete sequence and can allow for error correction by control words such as "erase, cancel" and formatting by control words such as "tab, line feed."

- Operator Mobility. By the use of a wireless transceiver an operator can have complete freedom of movement and still communicate with a speech recognition system.

The first speech recognition systems to be used by industry in various applications were installed by Threshold Technology, Inc. in the early '70s. The results from these initial operating systems indicate that a factory worker with minimal training can use a speech recognition system quite successfully.

Recognition accuracies obtained were equal to or superior to keying accuracies obtained from the same personnel.

Collins is a vice-president at Threshold Technology, Inc. in Delran, N.J.



Transparent to Firm's Customers

Intelligent Units Reduce Personnel by 100 Positions

ANN ARBOR, Mich. – While a network of intelligent terminals has remained transparent to Chrysler Credit Corp. account customers, it has reduced the company's data entry personnel requirements by over 100 positions.

The Sycor Inc. Model 350s are located in 115 North American Branch offices to process new accounts and delinquent information.

Chrysler's Car/Retail system, which maintains up-to-date records of outstanding retail vehicle accounts is built around an IBM 370/145, which operates under OS/370 and VS/370.

The key to the system is the rapid movement of information which supports the fundamental, yet often elusive, principle of "management by exception," according to J.W. Bolin, manager of systems and computer services at Chrysler Financial Corp. (CFC) headquarters in Troy, Mich.

To date, the system has eliminated the posting of branch-maintained ledger cards on routine payments; removed many tedious repetitive jobs from branch responsibility, including most of the frustration of looking for lost or misplaced ledger cards; and relieved the branch offices of much manual effort by centralizing and mechanizing the computation and maintenance of delinquency control records at the home office.

The system has also improved profits by more efficient use of people's time and uses of modern equipment for branch assistance where practical, Bolin said.

To achieve its objective, the Car/Retail system exploits the current technology of the computer and communications field, Bolin said, including the employment of optical scanning for the translation of retail contracts into computer-processable files; the use of satellite computers in Atlanta, Detroit, Los Angeles and Philadelphia linked to a large home office computer; and the use of microfiche for both temporary and permanent branch office records.

In addition, the system uses a national time-sharing network for daily processing and communication to and from branch office teletypewriters and the home office computer, he said.

The retail master file, prior to conversion, was updated with all transactions on a once-a-month basis. It consisted of 30 reels of tape and required 14 hours of computer time for updating.

Daily updates are now running in about four hours – almost precisely the objective established prior to conversion, Bolin noted.

Prior to conversion, the U.S. branch offices received the customer's payments and payment stubs, deposited the funds locally, posted the transactions to ledger cards and sent the payment data via U.S. mail to financial headquarters, he said. Headquarters then had to duplicate posting efforts to update the master account files on computer tape. The determination of individual customer account delinquency was made at individual branch locations by the daily review of ledger cards.

The ledger cards were then used for the manual preparation of late notices, collection followup and delinquency statistics.

The actual conversion of U.S. branch locations was accomplished in six months, beginning in June 1972, Bolin said.

First, an internal task force primed the branch managers and their staffs as to what was coming, why and how it would make life easier for all concerned by conducting seminars for each of the four major areas of the company, he said.

Informational manuals were developed to educate those who would be involved in an attempt to bring everyone on board as quickly and enthusiastically as possible.

Second, the company's customers were advised that, effective with their next payment, their checks should be mailed to a new area data center address. Four such centers were established in Detroit, Philadelphia, Atlanta, and Los Angeles, each with its own satellite computer..

The objective was to receive mailed payments from customers on a timely basis as well as efficiently process the payment data and funds, according to Bolin.

Third, teletypewriter terminals were delivered to each branch office, bringing them instant access to a national time-sharing network via local telephone dial-up. Each branch and regional data center accesses the Car/Retail system on an as-needed, right-now basis to receive relevant account information such as payments received on delinquent accounts, average daily delinquency statistics, repossession statistics, revised terms and so on.

The key here is the word "relevant," according to Bolin. One extremely important aspect of the entire system is that it emphasizes "exception reporting," wherein each branch can now concentrate on the unusual customer payment history rather than wading through all outstanding accounts to determine the status of the very few, he said.

In May of 1973 the system was extended to permit communication from branches to the home office via the branch teletypewriters and the time-sharing service.

The time-sharing network collects, balances and stores account data from the branch locations at the time-sharing computer center until Chrysler is ready for the daily updates of its internal master files. The new data is transmitted into the company's computer using high-speed services at 2,000 bits/sec which allows transmission of up to 600,000 8-bit char/-hour.

Last August, the company began installing a network of Model 350s, known as the Branch Intelligent Terminal System (Bits) to take the place of a currently installed optical scanning systems and a teletype-writer/time-sharing system, Bolin said.

The Model 350s now capture, edit and balance account activity (previously processed via the teletypewriter/time-sharing system) which affects the status of an account, he said. This information is transmitted directly to the home office computer center where it is combined with payment data from area centers and is used to update the company's master files.

Resulting information is transmitted back directly to the Model 350s in each branch location.

New credit contracts are manually prepared in branch offices and contract information in hand written onto machine-readable documents, which are then mailed to CFC headquarters for optical character scanning, Bolin said.

Computerized, the data is edited, verified and reviewed for the inclusion of alphabetic data via on-line video display terminals. The record is then processed through a subsequent edit run and finally a master record is created, as well as a coupon book and account card, he added.

With the Model 350s, the hand preparations and optical scanning are being eliminated. When the customer has been approved for credit, contract information is typed into the terminal.

Calculations, edits and crossfooting of money entries are performed by the terminal, Bolin said.

As the procedure on each contract is completed the information is stored on the Model 350's diskette, then transmitted nightly to Detroit for processing on the 370/145.

All the benefits of the previous system remain according to Bolin, with three improvements: branch capacity to handle new business activity has been increased; communications with the central computer center are direct; and productivity has been increased and corrections minimized by capturing data at the source.

FACTORY DATA COLLECTION SYSTEM

CUSTOMIZED TURNKEY SYSTEMS

APPLICATIONS

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Language of Human Brain Called Natural Data Processing Code

BOSTON – "There is . . . at least one natural information processing language: the internal language of the human mind..

"Once the neural language of human thought and memory has been decoded, it will be possible to program a computer in it and to transfer programs directly to the computer from the appropriate neurons of the human brain."

These thoughts were given by Dr. Adam V. Reed of Rockefeller University to persons attending the annual meeting of the Association for the Advancement of Science here earlier this year.

The optimal development of the computer, in terms of its users, is "still several decades in the future," the scientist who is currently involved in work aimed at deciphering the internal processing code of the human mind, said in his presentation, "Brain-Computer Hookups: The Ultimate Usage Mode of the Indefinite Future."

Extension of Natural Brain

"Ideally the computer of the future should be an electronic extension of the natural brain . . It should share with the brain the implementation of the informational processes which we think of as our minds." Reed said.

"It should also cease to be an external, consciously manipulated artifact and become no different, from the user's view point than any natural part of his brain.

"Physically, it should make contact with natural neurons for both input and output without interfering with their normal operation.

"Input from computer to brain will probably follow from technology currently being developed in the area of neuroprostheses for the blind. Prostheses currently being experimented with reach only the surface of the brain, making no contact with individual neurons," Reed said.

"However, it is obvious that much better performance can be obtained by stimulation of individual neurons in the patient's visual field, and this is the direction neuroprostheses work is likely to follow.

"The limiting factor in the development of directly linked computers," Reed said, "is likely to be our knowledge of the location of relevant neurons and of the internal code of our minds."

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Eliminates Much Paperwork

Mark Reader Net Aids Insurance Firm's Accounting

CUPERTINO, Calif. – A nationwide data collection and communications network of optical mark readers has helped at least one insurance company here meet its cash accounting needs.

The National Life and Accident Insurance Co. is using more than 200 Hewlett-Packard Co. (HP) Model 7261A optical mark readers to eliminate the time-consuming accounting operations previously performed manually in its field offices.

National Life ranks among the 20 largest insurance companies in the U.S. with 254 district offices in 27 states. These district offices communicate directly with the home office in Nashville, Tenn., supplying data on the transactions conducted with the company's 8 million policyowners.

In the past, this accounting operation was performed manually at the end of each month. Throughout the month, each agent recorded his customer transactions in a large collection book, which also served as the policyowner premium accounting record for the company. Collections from 50 to 130 accounts were recorded daily in this way by the salesman.

At the end of each month, the agent was obliged to compile these numerous transactions and balance his accounts. This process not only required several hours, but the agent had to recall numerous transactions which occurred during the month, leaving National Life with the difficult task of making important management decisions from manually derived information.

This problem has been solved with the installation of field communication stations in each of the National Life and Accident offices. These stations consist of an HP Model 7261A optical mark reader interfaced to an "intelligent" communications terminal, according to L.H. Stevenson, director of data collection and communication systems.

"By using optical forms, this data collection system meets National Life's requirements for a simple, versatile and accurate data entry tool. It has allowed us not only to improve the monthly reporting, but also to establish a daily accounting and record maintenance system," Stevenson said.

A computerized system located at the home office prints optical sales and service documents that include policyowner information in both visual characters for the agents' use and binary codes readable by the machine.

Two Forms Used

Over 90% of all National Life's transactions require the use of only two different forms, the weekly premium and monthly account documents.

These two forms are printed under computer control to include the name and address of the policyowner, details of up to nine weekly or monthly policies, total account premium, a calendar of 36 weekly or 12 monthly due dates and an individual account number.

When the agent collects an account premium, he enters a pencil mark on the account document calendar to indicate the week or month through which premiums are paid. After the agent has visited his policyowners to collect premiums, he delivers the optical cards, along with the payments, to the district office. There the cards are read through the optical reader into the terminal.

Each district communication station is equipped with a mark reader and an intelligent terminal with cassette storage. The terminals communicate with the home office data center through telephone Wats lines.

Unattended Operation

At the end of each day, with all transaction data stored on cassettes, the terminal is set for unattended operation. Early in the evening, the home office data center automatically calls each district office in turn, activates the terminal and instructs it to transfer all data on the cassette. The computer then uses this information to update company account records.

Before morning, the data center again calls the district offices and transmits totals for each agent's collections of the previous day. Any discrepancies between the net-updated total and the agent's net deposit is tagged with error messages.

Account documents are then returned to the agents to be used for reporting future collections. When all premiums on a due date calendar have been reported, the document is automatically replaced by the home office.

Input Subsystem Improves State of State Finances

LITTLE ROCK, Ark. – The State Department of Finance and Administration here has built its financial management system upon an input control subsystem featuring "automated documents" and user involvement.

Four key-to-disk processors control 53 keystations situated in user departments such as Income Tax, Motor Vehicles, Licensing and Administrative Services. The motive for installing the Mohawk Data Sciences Corp. (MDS) 2400 systems was to gain control over all incoming documents and remittances by assigning complete processing responsibility to functional sections.

Data entry and cash control operations are no longer centralized. Section managers now have tracking control over their incoming transactions – from receipt through final, validated posting to detail accounts.

"Data entry is just one aspect of our input control subsystem. It's what is done with the information at point of entry that makes the difference between mere capture and a total system. We have always attempted to disperse our data entry functions by scattering key-entry devices throughout user departments," according to Berry Johnson, manager of data planning for the Revenues Division.

"Prior to the MDS key-display system and other procedural changes," Johnson continued, "we had key-to-disk systems that did little more than record what we keyed for transferral to the main computers. What was lacking was control over the records once they passed through the data entry cycle.

"It became very difficult to trace and cross-reference source documents, payments and account transactions, thereby causing a delayed or incomplete response to inquiries from taxpayers, auditors and section managers."

Automated Documents

Arkansas' present system converts paper documents (income tax and license forms, checks, etc.) to automated documents. Beginning as a manual procedure in each section, documents are first classified and assigned a system reference number. Cash amounts are also tabulated for batch balances. This sets the scene for data entry.

After source documents have been keyed to intermediate disk storage on the MDS 2400s, the documents are microfilmed and then destroyed to eliminate bulky paper storage. During keying, the system checks each record thoroughly for correct field ranges and extensions.

Batches are automatically zero-balanced to agree with preaudit totals. And, most importantly, paper documents are converted to machine records and formatted according to predetermined system requirements.

Source documents are usually designed for the people who use them rather than for the computer that must process the information. Source document control – a turnkey feature of the MDS key-display system – completely reorganizes accounting data during the key-entry cycle. The feature provides accumulation, subtotaling and zero balancing by field, register, document or batch.

Instead of producing mirror images of input documents, source document control allows definition of entered data into system documents, with each element of the document individually accessible by the system.

Using source document control, a real relationship (not an artificial document-induced relationship) is maintained between fields.

Keyed fields may be applied to multiple purposes such as zero balance for one register and true accumulation for another register. The system effectively converts literal amounts to departmental values.

Input keystations situated in user departments are connected to their controlling key-to-disk processors.

These automated documents are then passed on to central computing via magnetic tape to be incorporated into the data base file. The total system approach, from receipt of document to file update, ties each transaction into an easily retrievable and verifiable bundle of information.

"All the edits we can do during the entry cycle cheaper than on the central computers we do on the MDS systems. Automated documents become the focal point for reconciling source documents with our data base," Johnson said.

Income Tax Processing

Walter Skelton, assistant director of revenue services, is responsible for all incoming revenues (income tax, sales tax, license fees, etc.) and their speedy disposition via state treasury deposits and taxpayer refunds. His division is the primary source of revenue for all state agencies.

To establish control over his system, Skelton distributed MDS keystations throughout the revenue building to give individual departments user control. The income tax section has capable people in all areas, cross-trained in data entry, microfilming and mail processing. In this way, responsible service is available at all times to the taxpayer, he said.

Two MDS key-to-disk processors control the 36 distributed input stations at the Revenues Division; the third processor, partially reserved for backup, is assigned special applications such as remote job entry, communications, report generation and custom-designed validation routines written in Mohawk Data Language (MDL). These MDL programs play a key role in the overall computer system.

"There are definite advantages to off-line editing for large volume processing" Skelton explained, "especially in revenue situations where imbalances are mostly taxpayer-induced math errors. By applying the backup processor with its MDL programs to front-end editing, we allow our key operators to concentrate on keying instead of checking for errors they cannot correct. Also, the backup processor performs many one-time, low-volume jobs which could not be cost-justified on the larger systems. This service has proven

(Continued on Page S/10)

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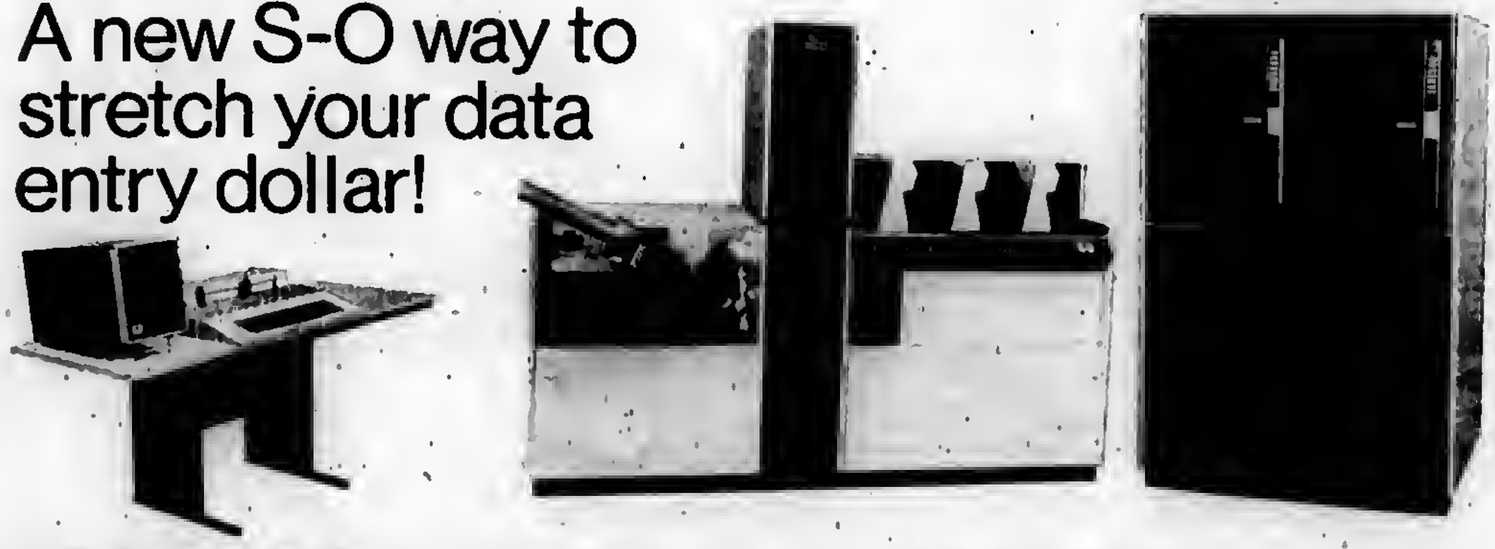

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New Uses Seen Rejuvenating OCR Concept in '70s...

By Fred Zirkle

Special to Computerworld

Introduced over 20 years ago, optical character recognition (OCR) was acclaimed by many to be the long-awaited solution to the data entry bottleneck.

OCR is essentially a 20-year-old technology being reawakened in a '70s environment to find obsolete, unfounded arguments against its usefulness clouding its future.

Originally, OCR was designed to function as an input unit. Unfortunately, most people still think of OCR as an input unit for photocomposition equipment.

Now OCR is used to drive the word processor thus gaining a new dimension and future in the world of data processing. If OCR has been around for 20 years, why aren't there more OCR installations which could automatically convert human—readable data into computer-readable codes at speeds hundreds of times faster than the normal keying rates? Today the average OCR installation costs around $100,000. Many organizations cannot cost-justify this massive expenditure.

Selling the concept of OCR has not been a problem. Certainly everyone would like to be able to enter data as quickly and efficiently as possible (especially when 60% of the average data-processing budget is spent on data entry).

However, the reason most data processors do not convert to OCR today is their lack of confidence in its dependability as an input unit. This is mainly a carry-over of the problems encountered in the '50s by underdeveloped OCR systems.

OCR users now indicate they have achieved better then a 99% acceptance rate in error-reject situations, proving in fact that OCR can be a highly dependable system.

Operator Acceptance

Operator acceptance has been a suprisingly pleasant experience. Operators have expressed excitement over being able to increase their data entry rates by a factor of 20.

Even the successful OCR user is approaching a dilemma as distributive processing allows him to process data remotely, yet his OCR installation, which has cost-justified itself, is back at headquarters.

OCR has been required to enter data in such large volumes that it was not humanly possible. The speed obtained through OCR is now being lost as a result of mailing time. These same forms can now be processed at the branch by installing 50 small wands for the same cost as one major OCR system.

Factors in Data Entry

There are several factors in data entry that DP managers take into consideration before determining the type of system that would best suit their own specific applications and procedure methods. These are turnover, training, productivity, increasing volumes, time delays, errors and increasing cost.

In data processing, the most immediate problem is speed (along with accuracy). Data processors are continually becoming more efficient and productive, but data input is not increasing its speed on an equal ratio, thereby creating data entry bottlenecks.

Everyone knows what data entry bottlenecks are, but not everyone knows how to solve the problem. A good analogy is a freeway traffic jam or "bottleneck" in which curves and turns slow down the flow of traffic. Each day new cars are being added to intensify the problem. Although the number of highways are increasing, they are not increasing proportionately to the influx of cars.

In essence, if one could control the flow of traffic by pacing each car and controlling each car's speed, one could eliminate any possibility of a traffic jam (of course an accident could unpredictably occur, such as in a data entry situation where an error reject occurs).

In data entry the problem is the same: too much data to be entered and not enough control or speed to handle it. One argument against OCR relates that in making source documents OCR-ready, a typist would have to be extremely careful, which involves not only extra time, but additional cost. This simply is not true.

In every situation pertaining to data entry, the information entered has to be correct, and the burden of this responsibility is going to fall on some individual within a company. OCR places this responsibility at the source.

A typist's speed is virtually the same on a data entry terminal as on a typewriter, even with the latest time-saving devices now being offered.

So, by reducing the necessary functions down to their most basic economical state, machine requirements can be reduced and the operator's function will become more specialized and effective. In other words, accept the facts, and take the time to make the source documents

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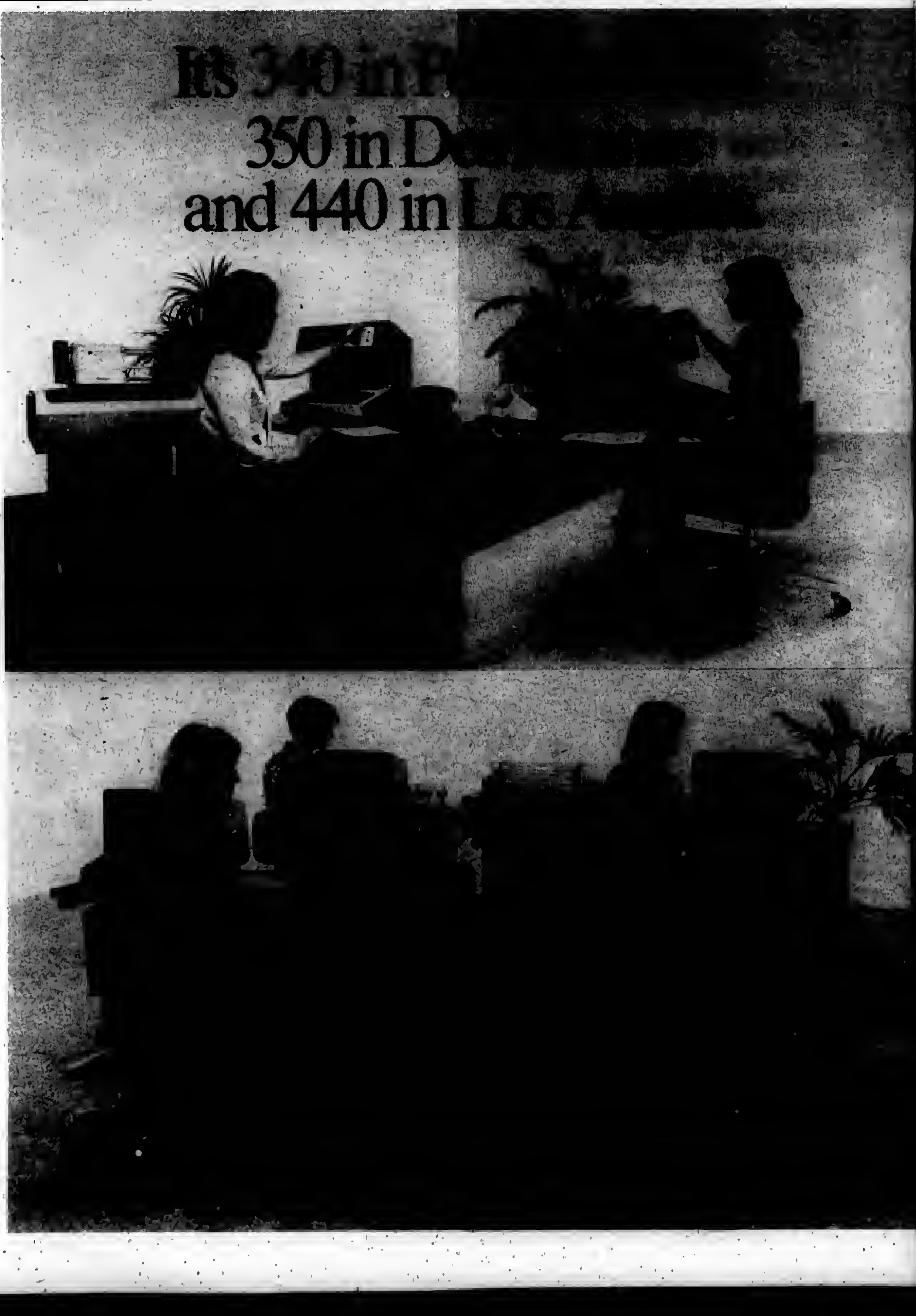

...But Obsolete Arguments Against It Still Prevail

(Continued from Page S/8)

OCR-ready, and OCR will handle those bottlenecks while saving overhead dollars with its high throughput rate and versatile capabilities.

There are many other arguments against OCR, but for every unfounded argument there is a solvent, realistic answer, factually based on its proven user performance.

One pessimistic view to take at the first thought of converting to OCR is that all source documents would have to be printed in one of the OCR-recognized fonts, consequently limiting one to certain capabilities.

However, if this is examined in more detail, one will find this no longer applies as a valid argument against today's OCR systems.

Over 95% of source documents are rekeyed for data entry. Yet these documents must be machine printed, line printed, typewritten or hand printed. OCR capabilities can read fonts from daisy wheel printers, line printers, typewriters, embossed card encoders and even handprint.

Most of these source documents are rekeyed on any of the 500,000 data entry terminals in use today. On each of these terminals data entry speeds are limited to how fast the human operator can move his fingers.

25 Times Faster

Normal data entry speeds are approximately 2 char/sec. Without obsoleting present equipment or changing software, a user can plug an OCR system into his terminal and enter data up to 25 times faster. An operator with no prior training after 10 minutes can wand in printed material at speeds of over 50 char./sec.

Another concern is that the quality of print on the source document must be in excellent condition and well-maintained with the most care for future use. This too, is no longer true. As far as maintenance, those requirements would be no more than what is already involved in the standard method and procedure of an office filing system.

Not having to reorganize procedures and methods by implementing new equipment (which defeats the original intent of saving money) is an important concern to all potential OCR users.

OCR provides shorter processing cycles which helps to avoid unnecessary cost. OCR out performs an operator-manned keyboard on a 250/1 to 500/1 ratio. By the late '70s, 40% of the U.S. operational computers are expected to have data communication capabilities, but the major data volumes handled by this equipment will be using off-line methods for data entry. OCR is now used in off-line or on-line situations.

Wand Applications

By attaching a wand to a CRT the problems of accurate and timely entry are solved while lowering communication cost. While OCR has been used in some of these applications, the wand is most suitable as the hassle of one standard message form has been eliminated. Purchase price is also more reasonable.

The average $10 million company spends in excess of one man-month per year simply recording part number for inventory audit. The wand is ideal for scanning loose tags or lables attached to boxes and shelves. The document transport is ideal for high-volume reading of tags printed by line printer, typewriter or even handprint numerics.

One percent of our gross national product is spent on actually handling cash transactions. Volume not humanly possible to record as well as time value of money dictating timely recording has made OCR a vital and successful means of recording this data.

Nevertheless, with distributive processing and time for mailing to a central site OCR is now within the reach of every branch office because of the wand purchase price. Some successful OCR users are presently considering installing 50 wand systems in remote sites for the same cost as their central OCR installation.

As more and more executive personnel are finding themselves on the keyboard, the wand is ideal for entering at 50 char./sec, a rough draft for edit changes on the CRT.

With over 500,000 data entry terminals all limited by how fast the operators' fingers can move, the wand is an obvious complement.

Zirkle is president of the OCR Division of Key Tronic Corp.

'En Garde!!'

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

If you've considered the advantages of distributed data entry and processing, you've probably discovered a sad truth:

A system that's fine for Poughkeepsie might be a washout in DesMoines.

Different sites have different needs. From remote data entry, to communications, to remote inquiry and response, to on-site report and forms generation.

And to overwhelm a small branch with high-powered equipment is just as bad as under-equipping a large one.

To match each of your branches with exactly the right equipment, in both hardware and software, there's only one terminal manufacturer to turn to. Us.

We're as flexible as you are.

Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

Our Model 350, for instance, might be just the ticket for your two-man operation in Des Moines. While a larger branch in Los Angeles might require the concurrent background processing capabilities of the Sycor 440.

And, while each of the three terminal systems has its own unique capabilities, they all work together in a remote processing network.

Each, for example, can be programmed with our high-level, easy-to-use TAL language. And, they not only talk to your CPU, but to each other.

And that means flexibility.

Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

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We invite you to take a closer look at our family of distributed data entry and processing systems —the lowest cost answer to your branch office needs.

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OCR System Expected to Cut British Health Plan Costs

LOS ANGELES – The British government has begun using a computer system to "read" hand-printed forms filled out by clerks administering the national health plan.

It's estimated the system will scan and record data on some 2 million health care recipients annually, thereby cutting data entry costs.

The optical character recognition (OCR) system, known as Grafix 1, has completed final testing in the central office of the British Department of Health and Social Security (DHSS) at Newcastle–Upon-Tyne, England, and gone operational.

The computer-controlled reader was developed by Information International, Inc. (III) in Los Angeles, Grafix systems typically sell at a price of $2 million to $3 million.

In the first year's operation, the system is expected to read 1.6 billion alphabetic and numeric characters. During factory tests, the system achieved sustained recognition rates exceeding 150 char./sec reading mixed hand print and computer print, III said. Less than 2% of the characters were unread by the machine and required later human interpretation. The error rate was under .05%.

In the current application, computer-prepared forms are being used by some 1,800 clerks to fill out data on health care recipients. They hand print information on 11-3/4 in. by 10-1/2-in. forms, which then are microfilmed.

The film is entered into the system, which reads the microfilm page images, including both the computer-prepared line print and the clerk's hand print, and stores the character information on magnetic tape.

That tape transfers the data into the department's main data processing center. Thus, only the microfilm need be stored permanently, eliminating the need for paper archives.

Until now, all data supplied by the clerks had to be keypunched to create magnetic tape for computer processing. Part of this operation will be supplanted by the new system.

Because of the wide variety of people's hand-print styles, the system was designed to recognize more than one shape for most characters.

This means the clerks will be able to continue printing in their normal styles, rather than in an unnatural manner to accommodate the system.

"If Grafix 1 fails to recognize the character automatically, it stores a 'picture' or graphic representation of the unrecognized shape – maintaining an index of the character's position and the file from which it came," according to A.L. Fenaughty, III president.

"In a separate operation, the unrecognized image is presented to an operator on a CRT. Seeing the garbled letter or number in context usually results in operator identification. The character then is entered into the system through a typewriter-like keyboard," he added.

Input Control System Helps State Manage Revenues, Finances

(Continued from Page S/7)

invaluable for the smaller revenue sections which have little or no data processing funding."

"The data entry sifting process recycles the data until clean," Skelton continued. "Each batch of tax returns is assigned a unique transmittal key at the moment of departmental data entry. This classification scheme serves as the basis of all further controls.

"It allows our MDL programs to match income tax statements against check amount, to check that documents are balanced and in proper sequence for the main computer system and to more easily retrieve records from the data base files."

Arkansas' automated revenue informatin system can now account for all documents and remittances through the life cycle of any transaction. The best testimonial to the effectiveness of Skelton's system comes from a user – Robert Fortney, director of income tax. "With direct input to the computer system" Fortney said, "we are accomplishing more concurrently; i.e., getting a lot more done in the same amount of time."

"When the system was first implemented," Fortney continued, "we mailed a trial income tax form expecting to wait the usual months for processing. A few weeks later the refund arrived!"

"This state ceases to function if we fail to fulfill our DP responsibilities," according to Don Martin, assistant director of administrative services. "We are now more highly automated for the degree of auditing we perform," Martin continued.

"The state constitution mandates 100% audit for all fiscal matters. By interfacing key entry directly with our financial management system, we achieve the needed degree of control and freedom from errors.

"This state could lose substantial interest on millions of dollars to be invested or deposited in various accounts just because of a data entry bottleneck or a delay in funds transfer because of keying errors," Sandy Kyzer, supervisor of systems analysis said.

"We are putting more confidence in data entry," Kyzer continued. "The state has upgraded its mainframe programs to match the preprocessing capabilities of our key-to-disk systems."

"Now that we have the more sophisticated MDS systems, we're not limited by record lengths or hampered by throughput rates," Kyzer said. "The annual operating budget, for example, is our biggest job.

"We used to farm out 60% of it to service bureaus, but now we can accomplish all but 10% on our present system. Balanced, edited information is available prior to the first month's (July) report, and rejects are returned to agencies the following day."

"Cost estimates for data entry services have greatly improved, too," Kyzer said. "Arkansas legislators are asked to appropriate sufficient funds for an entire year of computing services. Operator productivity is the chief factor in determining these estimates.

"Formerly, budgeted dollars were based on an input rate of 7,000 keystroke/hour. Now we can count on 9,000- to 11,000 keystroke/hour for some applications, thereby reducing our appropriation requests significantly."

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Costs 30% Less Than OCR

Key-to-Disk Improves Store's Throughput 20% to 40%

HOUSTON – A 30% hardware cost reduction combined with a 20% to 40% increase in throughput and improved data flow have more than justified the acquisition of a key-to-disk data entry system for Foley's Department Store here.

"Using the source data processing capabilities of the Entrex system, "we've reduced anticipated data entry costs by 30%, according to R.J. Kennerty, divisional manager of DP for Foley's.

"In addition, our decentralized configuration allows us to edit data closer to the source," he said. "As a result, we've reduced errors substantially and increased throughput by 20% to 40% in all departments.

The key-to-disk system provides data control at the user department level, Kennerty added.

"At Foley's the user welcomes responsibility for data accuracy. Data is captured and edited by user clerical personnel, who are the people most familiar with the job. The end product has been cleaner data reaching our mainframe. Also, overall data flow is more efficient and reports are generated on time, Kennerty said.

Each month Foley's processes well over 200,000 transaction records, including 5,000 personnel records (10,000 during peak periods), 191,000 merchandise information systems (MIS) department records and 4,400 accounts receivable records.

The MIS volume represents a 200% increase over the past year, creating a real throughput challenge to Foley's data entry system, Kennerty said.

In addition to high-volume processing requirements, process flow timing is crucial to Foley's daily operations. For example, Foley's buyers rely on timely reports concerning merchandise flow and trends. Also, a sales audit report is critical to daily updating of the accounts receivable system, he noted.

A reliable method of data entry was required to keep pace with the increase in input volume and to meet tight output reporting schedules established by Foley's user departments, he added.

Optical Scanning Difficulties

Prior to information of the Entrex system, most data entry at Foley's was accomplished using an optical character recognition (OCR) page reader with OCR-A typewriter font input. Despite the fact the optical scanning system was very effective to process flow, Foley's DP personnel had pinpointed several major drawbacks in the system.

- A high document-rejection rate resulted from fluctuations in typewriter ribbon quality.
- Excessive paper flow stemmed from the fact each rejected document had to be retyped and reentered into the processing cycle from the beginning: typewriter to OCR to CPU. Because of the lengthy error-correction cycle, certain inputs had to be cut off at midday to allow sufficient time for recycling rejected documents.
- The lack of editing capabilities during the entry cycle meant all errors had to be caught in a mainframe edit run.
- Finally, the effective throughput capabilities did not permit meeting the processing schedules. A 200% increase in data input volume in the MIS department persuaded Foley's DP personnel to search for an alternative to the page optical scanning system, and to provide a backup reentry system for the electronic point-of-sale terminal system.

Data Entry Requirements

In examining alternatives to the optical scanning system, Foley's processing personnel defined the following data entry requirements:

- User orientation. The system chosen must be easily assimilated into the user's environment, i.e., the entry system should combine clerical job knowledge with high throughput capabilities.
- Easy conversion. The conversion from the existing system should be accomplished transparent to user clerical personnel, i.e., the system should not disturb the users' current understanding of their individual systems.
- Preprocessing capabilities. The system should provide data editing and validation capabilities to catch errors at the source and eliminate the need for repetitive corrections cycling and excessive paper flow.
- Operational simplicity. The system chosen should provide simple English language data display to insure ease of oper-

(Continued on Page S/12)

Operators at Foley's enter data on key-to-disk units.

No "operator" required.

High-priced, highly skilled terminal "operators" are not necessary to operate the new source data entry terminal from MSI Data Corporation. Wherever SOURCE 7600 may be installed — in a warehouse, factory, accounting office, retail store — there's already an employee on the scene who can be trained in half a day to input accounting-type data with SOURCE 7600.

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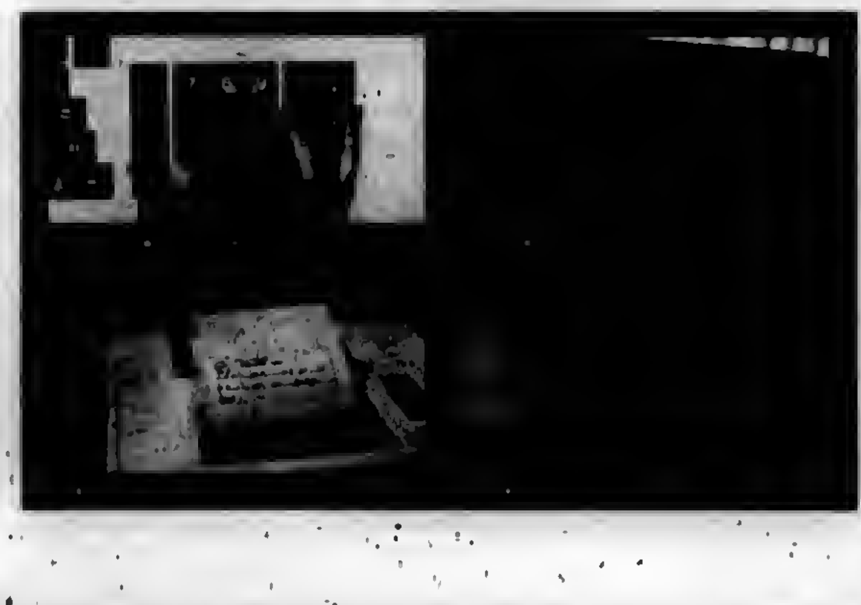

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Store's Productivity Increased 20% With Key-to-Disk

(Continued from Page S/11)

ation by non-DP personnel. Without memorizing mnemonics or complex error codes, clerical personnel must be immediately informed of keying errors.

- Source data control. Users must have complete control of their input, i.e., the responsibility for data accuracy must be placed at the source.
- Timely report generation. The system must he capable of meeting tight reporting schedules critical to Foley's process flow.

System Implementation

Foley's DP personnel examined key-to-disk systems from several vendors, including Inforex, Computer Machinery Corp. (CMC), Victor, IBM and Entrex.

"We discovered a basic functional overlap between all of the systems, but the deciding factor for us was the user-oriented design of the Entrex system," Kennerty said.

The key-to-disk system provides built-in English language prompts that keep an operator fully informed on all aspects of the entry process. No special codes or mnemonics have to be memorized, since all error and status messages are presented in simple English sentences, he said.

"For all the right reasons the responsibility for data accuracy would be in the user department. Consequently, the system chosen had to easily lend itself to our dispersed processing concept. Data should be entered and edited by the end users of the data, and in most cases this means by non-DP personnel," Kennerty said.

In October 1974, Foley's installed an Entrex System 480 equipped with a 9-track, 1,600 bit/in. tape drive and two 2.4 M-byte disks.

The System 480 CPU, located in the central computer room, initially supported 19 Data/Scope keystations, which were dispersed throughout the various user departments as follows: 10 keystations in the MIS department, three in personnel, two in accounts receivable, three in Sales Audit and one in the Computer Operations department.

"We converted from page optical scanning to the key-to-disk system with minimal disruption to user processing techniques," Kennerty said. "Paper flow between user departments and the DP operations department has been virtually eliminated. Data does not leave the user area; only an authorization ticket containing batch update information passes between the user department and our DP operations department," he said.

Users were quick to realize the advantages of entering their own data, Kennerty said.

"The new system provides user data control, which means data users have ultimate responsibility for data accuracy. To us, source data processing means source data responsibility. We have eliminated the errors of confusion that existed with conventional methods of data entry. The end result is fewer errors because of increased job responsibility and job familiarity."

Data Flow Improved

The system's ability to edit data at its point of origin has resulted in an immediate improvement in data flow, according to Kennerty.

"We now edit data as it is entered, which has allowed us to eliminate a time-consuming corrections cycle," Kennerty said. Eliminating the corrections cycle in turn has resulted in increased throughput.

"In all our departments, data entry throughput has increased from 20% to 40% simply because we have more time for input. Time formerly lost in the corrections cycle and in excessive paper flow is now devoted to throughput," he added.

For example, the MIS department now processes a 200% greater volume of data, using an additional five keystations. In both the Personnel and Sales Audit departments, up to 25% more data is now processed with no additional equipment, he said.

The key to Foley's increased throughput is simultaneous data entry and validation, according to Kennerty.

"The programming capabilities of the system, in conjunction with the system's built-in checks and edits, allows our users to enter data and simultaneously edit it on all levels – character, field, record and batch," he said.

For example, programs are written using the Entrex Editor language, which immediately detects errors and informs entry personnel of alternative courses of action in straightforward English statements. The key-to-disk system provides many validation/edit capabilities without programming, including value table and check digit validation, range checks and conditional verification, he added.

Additional Benefits

Several additional benefits of the system include the Operator Statistics feature, which provides an accurate assessment of operator productivity.

Stored in a program library on disk, operator statistics, including productive keystroke rates broken down by job or by individual operator, offer the user an effective data management tool.

Also, the system produces an audit trail on tape containing all input forwarded to the IBM 370/145. Generated via an Editor program, the audit tape provides an excellent means of backup in the event of mainframe or key-to-disk system failure.

Finally, Foley's DP personnel have written an Editor program that automatically ages data batches on disk. Using this aging information, operations personnel inform users of when to delete batches from disk so that disk storage may be maximized.

Last November Foley's installed an additional dual-disk System 480, supporting five additional keystations in the MIS department and eight keystations to be used for the new accounts payable/merchandise invoice control system. Future applications for the second System 480 include a refund control system, a price revision control system and a staple stock input system.

"To my way of thinking, the advantages of source data processing are two-fold. First, there is economics. It saves both time and money to capture and edit data once. At Foley's source data capture has eliminated a very costly corrections cycle and the excessive paper flow.

"Secondly, source data processing has allowed us to fit the system to our existing work environment.

"Consequently, the people who know the job's parameters are the ones who enter the job.

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Of course it has simple keyboard entry, CRT display and fill-in-the-blanks formatting. So forget about training new operators. Because it's designed to communicate with your clerical staff in people language, an hour or so of familiarization with the terminal is all that is usually required.

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With No Loss in Data Entry Accuracy

Incentive Plan Boosts Department Performance 30%

Special to Computerworld

CONCORD, N.H. – Implementation of an incentive system led to a 30% improvement in performance in the Blue Cross/Blue Shield data preparation department here.

Blue Cross/Blue Shield of New Hampshire and Vermont has been using two Mohawk Data Sciences Corp. (MDS) 2400 key-to-disk systems for its data preparation operation since November 1972.

The MDS software produces two statistics which help the department manager, Carol Young, measure the performance of data preparation operators. These statistics are keystrokes per hour and time on the system.

Keystrokes per hour records how fast an operator keys, and time on the system records how many hours during a week an operator is actually keying.

"We had been stressing keystrokes with a departmental goal of 12,000 keystrokes per hour", Young said. "We had come close to this goal several times, but never quite reached it. More recently, we began to realize the potential for improving departmental performance by increasing our time on the system. This had been averaging about 70%, or slightly over 26 hours of a 37.5-hour work week.

"We weren't sure what our goal should be, but in discussing the situation with Phil Funk, director of computer services, and Jeff Langmead, vice-president of corporate systems, we decided to set 80% time on the system as our goal.

"To help the operators in achieving this goal, we took another look at all of our applications and made some changes, such as eliminating some of the nonkeying functions performed by the operators and revising the sizes of the batches of work.

Most importantly, an incentive system was started to recognize operators who achieved the department's goals.

The Incentive was called the "80% Club."

The club was to be formed of operators who keyed at a production rate which was determined by multiplying an operator's time on the system by the keystroke rate. An operator had to achieve a monthly average production rate of 8,800 keystroke/hour by a time on the system of 80%. A senior operator had to maintain a production rate of 10,400 keystroke/hour, which was set by a keying rate of 13,000 keystroke/hour and 80% time on the system.

Awards for club membership included attending the monthly club meeting at a local restaurant. Three months continued membership meant a $50 cash award. An additional three-months continued membership meant an additional cash award of $75.

The results of the 80% Club have been outstanding, Funk said. Since May of 1975, average operator productivity has improved by 30%. The department is doing 10% more work than a year ago, with three fewer operators.

During May of this year, the department averaged 82.3% time on the system, with an average keying rate of 12,571 keystroke/hour.

This reduction in processing time was reflected in the total time required to process claims. Additional quality checks have shown that proper quality is being maintained with the increased production.

Optical Mark Readers Help States Meet Report Regulations

BOISE, Idaho – A Maryland vocational education research group is using optical mark readers both to help state agencies meet government report regulations more efficiently and to provide students with practical data processing experiences.

Ten Hewlett-Packard, Co. (HP) 7260As are associated with HP Model 2640 CRT terminals and HP Model 9866A thermal printers in remote station configurations located in school districts throughout the state.

The heart of the remote job entry (RJE) network is an HP Model 3000CX computer, installed in the Anne Arundel County Public School District near Baltimore.

The system was purchased as part of a research project entitled Administrative Information Management System (Aims), according to Gary Q. Green, director of the Maryland Research Coordinating Unit for Vocational-Technical Education (MRCU).

The purpose of the project is to test alternate ways to help agencies comply with the large amount of information required by the federal and state governments, while allowing hands-on experience for students.

Under supervision of state vocational education agencies, every school district in the U.S. must complete massive federal reports.

In attempts to reduce the cost and time expended, a few states have tried batch processing, but in most cases these efforts have been unsuccessful because of slow turnaround times. The MRCU decided upon a research project to find out if optical forms could provide the ease and versatility necessary for an on-line system.

The Aims system also processes data on vocational education students received directly from the remote stations. The key operating element in this operation is the HP Model 7260A optical mark reader.

The program is based primarily on the use of easy-to-complete optical forms. Now, 123 characters per student can be collected for a cost of 2.2 cents.

The HP 3000CX computer edits the information and compiles it into a final printout in a format acceptable to the Federal government. Using the Model 3000CX system significantly reduces forms handling and processing costs, Green said.

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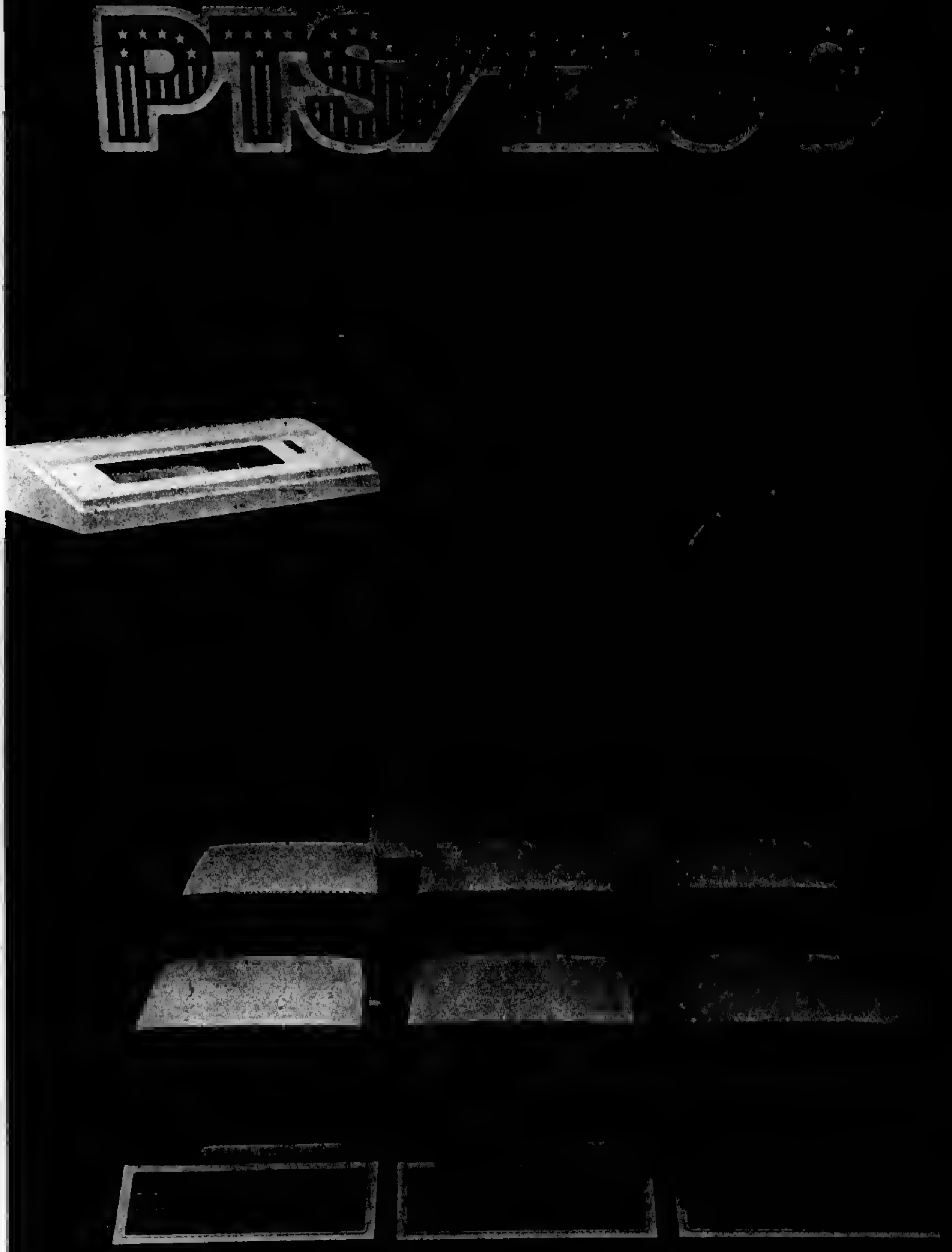

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RAYTHEON DATA SYSTEMS

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While Increasing Data Accuracy

Ordering Units Allow Salesmen Time for Selling

Hardware wholesalers utilizing electronic ordering systems for the collection and inputting of salesman order information have gained a substantial amount of time – time that is being used to improve many aspects of their operations.

Utilization of accurate computerized ordering data made possible with an MSI Electronic ordering system allows wholesale hardware distributors to increase sales volume, reduce data processing costs, reduce standing inventories while optimizing merchandise mixes, improve wholesale and delivery scheduling and offer substantial customer service advantages which help the retailer increase his number of merchandise turns, according to the users.

Salesmen use data entry terminals rather than paper, clipboard and pencils to record merchandise code numbers.

The five wholesale hardware distributors are Orgill Brothers in Memphis, Tenn.; Townley Hardware in Kansas City; Geo. A. Clark & Sons in Minneapolis; Pacific Marine Schwabacher in Seattle; and Stratton-Warren in Memphis.

Salesmen for these distributors use MSI Portable Data Entry Terminals to record their daily order information instead of hand writing the orders on forms and have eliminated either mailing orders to the warehouse or telephoning the information to an order taker.

Salesman use the MSI terminals to transmit their orders via ordinary telephone lines in less than three minutes, the users said.

Reduces Time, Labor

Using the MSI system reportedly reduces the amount of time and labor that was formerly spent preparing and inputing order information.

"Salesmen are gaining more time to do their selling job because they are no longer hampered with time-consuming ordering procedures. Employing the MSI system enables each salesman to spend more time with existing accounts or to prospect new ones," David Townley, DP manager at Townley Hardware, said.

Prior to streamlining operations with the MSI Electronic Ordering System, order information reached the warehouse operations in unpredictable patterns. Lengthy, uncertain telephone conversations between order takers and salesmen often were misinterpreted and wrong merchandise or quantities were shipped.

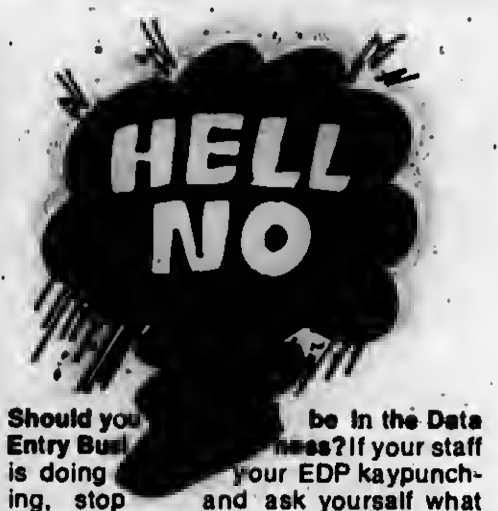
Delays in orders mailed to the warehouse were frequent and appropriate warehouse shipping scheduling was impossible. Errors in order filling were common, but the ability to track the errors down was tedious and time-consuming because any number of order-preparation and processing steps had to be checked.

"Sporadic preprocessing and processing poured work onto warehouses in unever doses, which caused unnecessary overtime expenses or left warehouse personnel idle for stretches of time," Byrne Whitehead, controller at Stratton-Warren, said.

Timely, accurate input of order information that can be scheduled on a daily basis means reduced turnaround time for the retailer. Many of these distributors report reductions in turnaround time by as many as seven days because the mail and preprocessing steps have been eliminated.

The result is better service and more accurate inventory control for the retailer, according to MSI. Because he is getting merchandise on his shelves sooner, he is reducing his out-of-stock condition and his ordered merchandise reflects what his actual shelf-inventory situation is, rather than stock ordered on estimation of sales.

By connecting a telephone receiver to the portable data terminal's communication unit, recorded order data can be sent in a computer-compatible form to a receiver at the warehouse processing center.



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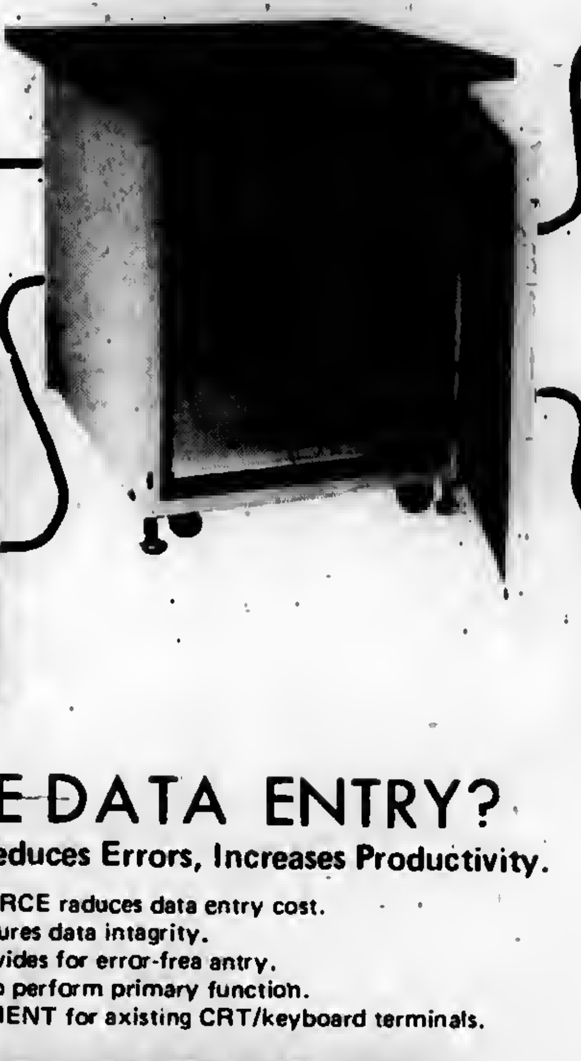

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Hospital Finds Key-to-Disk Cure for Work Pileups

MILWAUKEE – Two key-to-disk systems have proven to be the solution to a hospital's data entry workload problems and the key to a future information retrieval system.

St. Luke's Hospital has increased its data entry productivity 25% since installing an Inforex 1302 key-to-disk system and has been able to handle increased data entry workloads without a proportional increase in its staff, according to Ronald Hartig, operations supervisor at St. Luke's.

The 540-bed general-care hospital runs its data entry department three shifts a day, seven days a week, with the heaviest usage occuring on the 4 p.m.-to-midnight shift, when all five keystations on the 1302 are in use.

Nearly all the hospital and patient information processed by the hospital's IBM 360/40 computer is prepared on the Inforex 1302, Hartig said, adding that one IBM Model 129 keypunch has been retained for some low-volume card applications.

"We broke even on cost, even though we kept one keypunch," Hartig said, "but we've gained in productivity, reduced noise and have high-reliability equipment with excellent service."

"We have a very reliable system, in which the downtime is very minimal. We like it very much, and I don't see how anybody could have a card shop or other data entry system."

St. Luke's Hospital first made the switch from keypunch cards to key-to-disk in the spring of 1973, installing the 1302 with four keystations – a move which canceled the hospital's need to hire two additional operators at that time, he said.

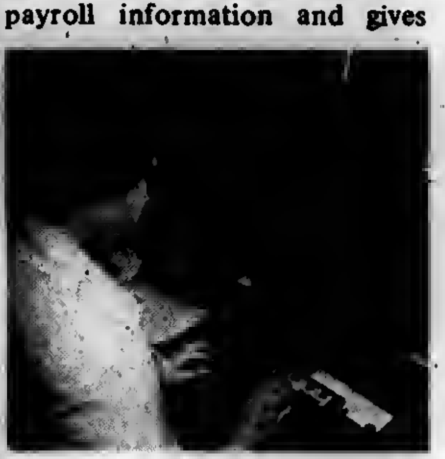
Since then, the hospital installed an additional keystation and hired one more operator, but the increase in St. Luke's data entry workload has exceeded the increase in data entry costs, he said.

"We are now keying in excess of 3,000 more records a week than we were before we added that fifth keystation," Hartig said. "Our total workload involves about 99,000 records per week."

Data entry applications now on the system involve admissions, patient charges for medicines and ancillary items, inventory functions, accounts payable, asset accounting, budget and general ledger reporting systems, patient discharges, patient room transfers and a building-fund contributors' reporting system.

St. Luke's Hospital also uses its key-to-disk system and computer in a checkless payroll application involving most of the hospital's 2,600 employees.

During each two-week pay period, the hospital prepares a computer tape with employee payroll information and gives that tape to a large Milwaukee bank. Net pay is deposited electronically in the account of each employee.



An operator at St. Luke's Hospital uses the key-to-disk data entry system.

Additional Productivity Gain

St. Luke's Hospital recently decided to upgrade its 1302 configuration to a five-keystation, Inforex 1303 system. The greater power and flexibility of the 1303 will allow the hospital to increase its data entry throughput even more, Hartig said.

For example, keystation operators currently enter data taken from patient admissions forms, he explained. Under the former keypunch system, that data required nine separate punch cards and nine individual "passes" through the form before all necessary data could be entered.

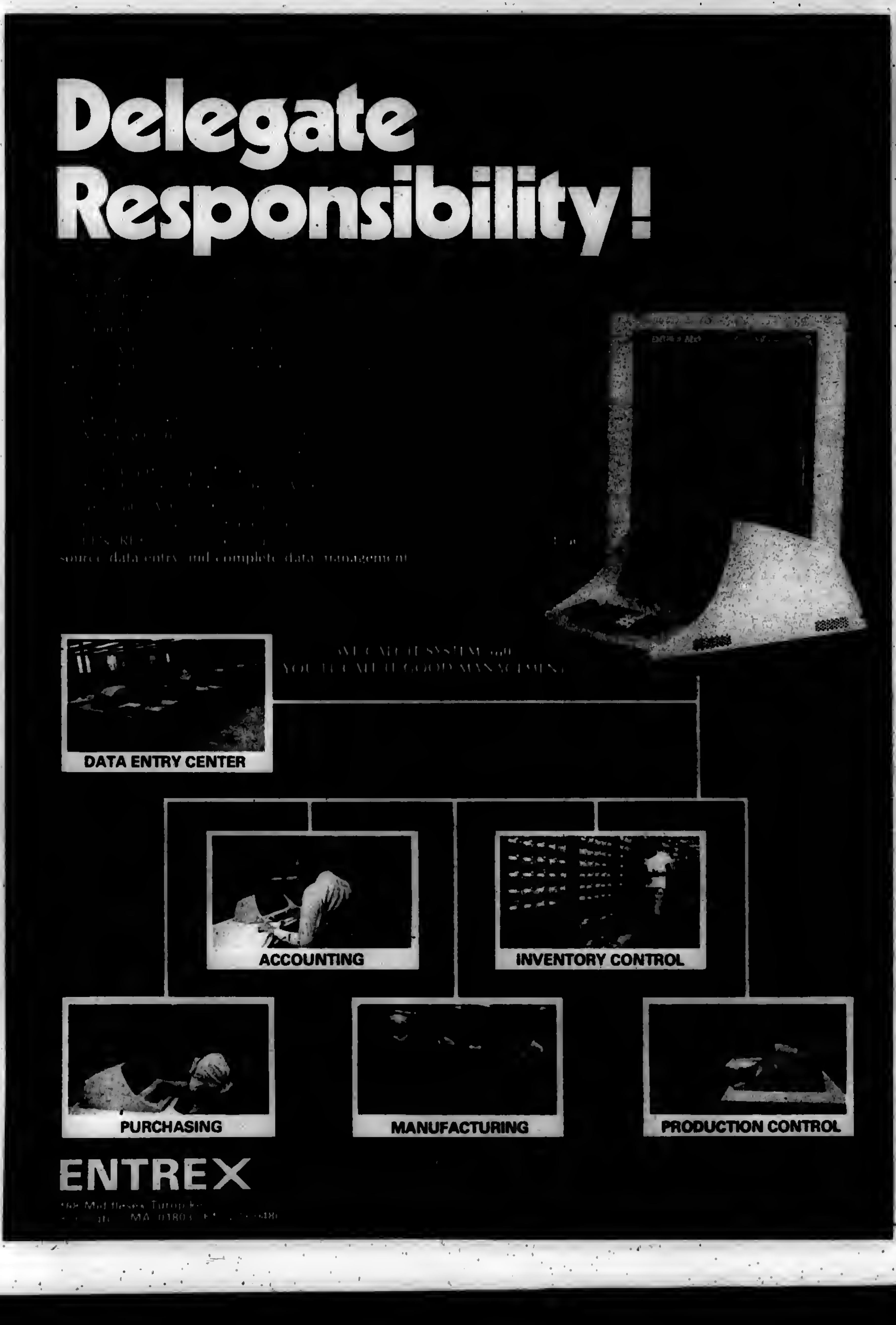
The 1302 can capture the same amount of data with only two passes through the form, Hartig said. The 1303, which allows a greater number of levels of programming, will allow keystation operators to capture all the data on an admissions form with a single pass through that form.

Currently St. Luke's Hospital maintains some 350,000 3 by 5 cards, each containing a record for every patient that had ever been admitted to the hospital.

"We have been maintaining those cards in a manual file, and the file is getting so large we would have to expand it. Since that's an outdated way to keep records, we plan to convert the information from those cards into computer format."

Initially the 1303 will be used for that conversion, Hartig said. When the conversion is complete, the 1303 will replace the existing 1302 equipment.

Currently, the card file must be searched manually each time an authorized member of the hospital's staff phones in a request for information. In the future computer terminals will be placed in the appropriate area of the hospital for data retrieval.



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Bits & Pieces

Saving Energy at DP Sites Theme of Five Symposia

CHERRY HILL, N.J. – A series of symposia on energy conservation is being offered in Boston, Chicago, Philadelphia, Jacksonville (Fla.) and Miami by AC Manufacturing Co.

The two-hour sessions on energy reduction in computer rooms include discussions on how to use less energy, lower electrical demand in computer rooms, reclaim computer heat and maintain reliability.

Further information is available from James Massett, AC Manufacturing Co., Old Cuthbert and Deer Roads, Cherry Hill, N.J. 08034.

Wright Line Keypunches Portable

WORCESTER, Mass. – Wright Line has two portable keypunches for plastic or paper cards.

The model 2610-00 encodes standard 20-column Type 2 and Type 51 credit cards with up to 240 punch positions; the Model 2620-00 encodes 3-1/4-in. high cards.

Wright Line 160 Gold Star Blvd., Worcester, Mass. 01606.

NMA Prints Government Standards

WASHINGTON, D.C. – The National Micrographics Association (NMA) has released a publication for micrographic service bureaus and manufacturers doing business with the U.S. government.

Entitled *Basic U.S. Government Micrographic Standards and Specifications*, the book contains reprints of the standards established by the government up to April 1976.

The publication, designated RS1-1976, is priced at $15 for NMA members and $20 for others from NMA Publication Sales at 8728 Colesville Road, Silver Spring, Md. 20910.

Ibfi Slates Conference on Forms

NORDIC HILLS, Ill. – The International Association of Business Forms Manufacturers (Ibfi) has scheduled a conference here July 28-30 covering the technical areas of common interest to forms manufacturers and those who design, plan, manufacture and support forms.

Formstech '76 will include sessions on the practical aspects of forms runability, the impact of standards and factors in forms design and feeding mechanisms which determine "like-cycle costs" of printout and reading systems.

Further information on the conference, which will be held at the Carson Inn here, is available from Ibfi at 1730 North Lynn St., Arlington, Va. 22209.

Centers Already Exist

Public DP Access More Than a Concept

By Catherine Arnst
Of the CW Staff

NEW YORK – Public access to computers is not just a concept being discussed at computer conferences – there are centers providing that service already in existence around the country.

A public computer center to be used primarily by school-children in Washington, D.C., is being planned by the Center for Inquiry and Discovery (CID) there. Part of that planning process consists of an ongoing survey of existing public-access computer facilities throughout the country.

Included in the survey are several research-oriented labs whose goal is the development of computer systems that can be used by the public. Twelve such centers have already been visited by the institute's staff.

One of these was the Lawrence Hall of Science at the University of California at Berkeley, a science museum staffed by students that has five terminals in the exhibit area linked to three computers.

The philosophy of the museum is to provide "a nonthreatening introduction to computers," Carol Kastner and William Underhill of CID said.

In Portland, Ore., the CID team visited the Oregon Museum of Science and Industry, which maintains a community research center providing access to scientific equipment that might be otherwise unavailable.

There, a Digital Equipment Corp. PDP-11/45 is used by about 40 high school students annually to do individual projects for which they earn credits.

A public access center not located in a museum is in a Menlo Park, Calif. storefront. The Community Computer Center offers computers for recreational uses; its activities include a hardware club, classes for teachers, birthday parties, field trips and game nights.

The Pacific Science Center in Seattle is located in the U.S. exhibit building of the 1962 World's Fair. The center has two terminals running games with time donated by local schools and businesses and is planing to expand its computer activities.

In Boston, CID visited the Children's Museum and the Museum of Science, both of which have exhibits featuring computers that can be used by visitors.

Some of the research centers visited so far by the CID team include MIT's Logo project, the Soloworks project at the University of Pittsburgh and Xerox's Parc group.

Logo has developed methods to help young children learn mathematics and logical thinking using the Logo language, computer-controlled devices and graphics.

Soloworks is developing the hardware, software and courseware for an open mathematics laboratory. It uses a wide variety of peripherals that include graphic displays, robots and a pipe organ.

Parc has developed a computer system and language called Smalltalk which is meant to make graphics and animation easy to use.

Versatec Claims Plotter System Cuts 360/370 Users' Overhead

SANTA CLARA, Calif. – A plotting system for IBM 360/370 users uses vector mode operation for high speed on-line electrostatic plotting with redued IBM 360/370 overhead, according to its vendor, Versatec.

The system includes an on-line controller, Versaplot/Pen Plotter Emulation Package (PPEP) software and one or more electrostatic plotters or printer/plotters.

The system controller emulates the IBM 3211 or 1403 line printers and provides compatible printer control and logic checking as well as buffers for print/plot lines, universal character sets and forms control, a spokesman said.

Channel address is via IBM byte multiplexer, block multiplexer or selector channel, he added.

The Versaplot/PPEP software reportedly provides a set of Fortran-callable subroutines compatible with existing incremental plotter routines.

Vector graphic information is accepted and converted to raster scan plotter output output by the system controller. The vector mode of operation substantially reduces host CPU time, core memory requirements and I/O channel time, the firm said.

Data is accepted on channel interface in burst, forced burst or byte multiplex mode. Using a double buffer of 2- by 1K bytes, the controller accepts a maximum burst rate of 500K byte/sec.

Three controller models are available to support one, two or four electrostatic units. Multiaddress configurations use only one position on the IBM bus, and control procedures and buffers are replicated for each attached unit, Versatec said.

The price for the controller is $13,500, while the cost of the software can run from $2,200 to $3,500 depending on the package, Versatec said.

Costs for the plotter range from $13,500 for the 22-in. wide model to $49,500 for a 72-in. wide one. Versatec is at 2805 Bowers Ave., Santa Clara, Calif. 95051.

The Bucks Stop Here

NEW YORK – Computer technology is helping American Express keep track of millions of travelers checks as they are purchased and cashed throughout the world. The final tally is now being taken by two newly installed IBM 3890 document processors here handling more than one million items per day.

The 3890s read the magnetic ink check number under the control of a pair of IBM 370/125s; the information is sent to a larger system for processing and recordkeeping. The checks themselves are endorsed and sorted at a maximum speed of 2,400 per minute.

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Combined With Typesetting Technology

Tapes Play Double Role for Cost-Conscious State Office

SACRAMENTO, Calif. – Keeping down the cost of government is the battle cry of many political figures these days, but in California the Office of State Printing (OSP) has been practicing such preaching for years with the aid of computer tapes and composition and typesetting technology.

Its most recent application entails having the state's payroll computer tapes perform double duty. In the process, production time for the wages and salaries section of the governor's annual budget has been slashed by more than 80%, an OSP spokesman said.

A similar application is reducing production time for the capital spending volume of the budget by 60%, he added.

Vincent Toolan, California's state printer, estimated an overall saving of $65,000 has been achieved.

Tapes End Up as Tome

Throughout the year, the computer tapes are used for customary payroll functions, such as issuing salary checks. Once a year, however, they are updated to project needs for the coming fiscal year and shipped to OSP for use in producing the budget.

The tapes are run through automated composition and typesetting equipment that transforms the data into pages of text which are then photographed to produce printing plates.

The wages and salaries volume runs more than 700 pages and is 1-1/4 in. thick. That tome has been published with this technique three years now.

This past January the same process was used for the first time to produce the other half of the budget, the capital spending volume that is 2-1/2 in. thick.

In the past, the budget was produced using traditional printing methods. Typesetters cast lines of type in hot metal, with months of copy preparation, typesetting, proofreading, editing, laying out and printing involved. Toolan estimated three to four months of several people's time were required.

For several years, the office has been using a Videocomp 800 manufactured by Information International, Inc. of Culver City, to publish a wide range of state reports and documents.

Since fiscal 1974, the wages and salaries volume of the budget has been produced by this equipment. Operators in the State Controller's Office and other state agencies handling payroll functions were instructed by OSP technicians in preparing their payroll tapes to serve the dual purpose.

Instructions 'Buried'

Information governing the composition and setting of the data—such as type style, size and column width as well as format of columns and pages— is added to the tapes.

In effect, this material is "buried" on the tapes and does not effect their ongoing use for salary administration, Toolan said. But, when the tapes are inserted into the Videocomp 800, these instructions guide how the data is set up as text.

Operators in the State Controller's Office alter their tapes once a year to incorporate salary projections for the coming fiscal year, and the tapes are then sent to OSP for use in producing the budget.

"It's simply a matter of taking an existing computer file and massaging it to produce the printed document," Toolan said. "The three major elements are the State Controller's Office, which issues checks for state employees, the University of California and the Trustees of the State Colleges and Universities.

"These organizations use standard DP techniques to update their computer files," he noted.

"The files usually are complete when they send them to us, but we have the ability to go in and make changes easily," he added.

However, Toolan noted, information for the capital spending volume is not always standardized and new tapes often have to be keypunched to update information. That's why the time savings for that book isn't as great as with the wages and salaries volume, he explained.

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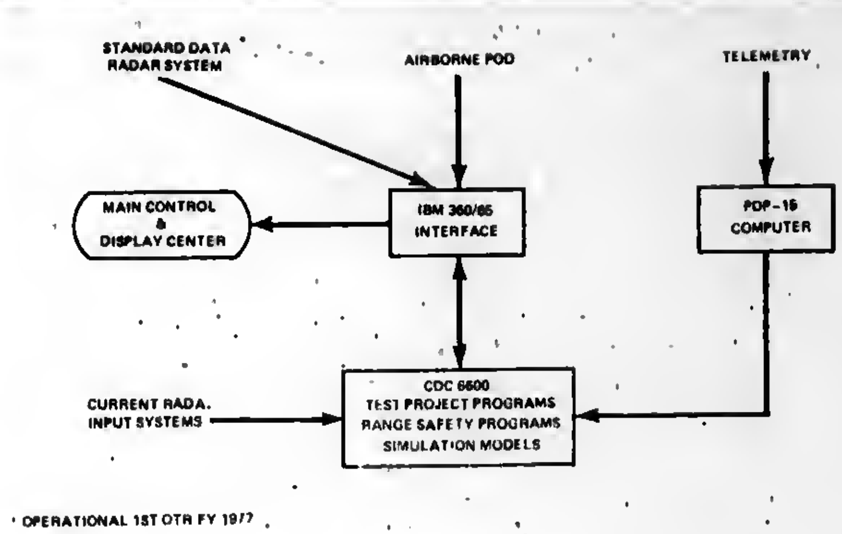
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PDP-15 COMPUTER
CURRENT RADA. INPUT SYSTEMS
CDC 6600 TEST PROJECT PROGRAMS RANGE SAFETY PROGRAMS SIMULATION MODELS
OPERATIONAL 1ST QTR FY 1977

Consolidated Elgin Real-Time System

ELGIN AIR FORCE BASE, Fla. – The U.S. Air Force (USAF) Armament Development and Test Center (ADTC) located here has as its mission the safe testing of newly developed conventional munitions. Increasing emphasis on safety and cost-effectiveness of test missions has led to the development of a computer-based Consolidated Elgin Real-Time System (Certs).

The system involves real-time data collection, processing, display and result transmission while the aircraft and/or missile is flying its mission.

To accomplish this task, the Computer Sciences Laboratory at ADTC has designed and developed in-house a computer complex that includes an IBM 360/65, a Control Data Corp. 6600, a Digital Equipment Corp. PDP-15 and several PDP-11s.

Computer output is provided on CRTs for observation by test personnel, and the information to be displayed may be selected by means of alphanumeric keyboards. A communications network was fabricated to permit vocal control of mission status and to permit test personnel to talk to aircraft crew members and/or test controllers.

Input data sources to the Certs system consist of several radars for aircraft or object tracking and telemetry data from airborne sensors or ground receivers.

The data is centralized in the IBM 360/65, logged on magnetic tape and then dispatched to a real-time applications program on the IBM or CDC 6600 machine. The PDP-15 is the telemetry data front-end processor for the system, and it converts any type of signal into engineering units and then transmits the data to the CDC 6600, an ADTC spokesman said. The display processing is handled by the IBM 360, which is connected through a locally designed fabricated interface to the CDC 6600.

A backup to the large computer system is provided for present-position situation displays and some limited alphanumeric data on a DEC PDP-11/40. The PDP-11/40 is interfaced to four Tektronix, Inc. 4014 storage tube CRTs with hard-copy capability.

Certs Software

The system software to support the Certs complex is partly vendor-supplied, but heavily modified or supplemented by locally written routines. The CDC 6600 operates in the Scope 3.4.3 operating system with some very minor modifications to the job scheduling routines, the spokesman said.

Several real-time peripheral processor unit (PPU) routines were written to support up to four simultaneous real-time jobs on the CDC 6600, which may in turn communicate with a job on the PDP-15 or up to four jobs on the IBM 360.

The 360 operating system is O/S-MVT Release 21.8, with a heavily user-modified, vendor-supplied, real-time monitor (RTM) program. A submonitor was written locally to provide for 360 real-time job scheduling, data transmission and recording and all display processing and input/output operations.

The applications sottware on the Certs system is written entirely in Fortran and may be run on either the IBM or CDC computer, the spoksman said. The applications are mission-oriented and may have either a data reduction or range safety application or both.

The aim of the Certs design philosophy is to develop relatively small, modular programs which may be readily adapted to changing mission requirements or discarded if written for a one-time support requirement, the spokesman added.

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System Helps Keep Cash Flowing for Water Department

HOUSTON – This city has turned to a computer system to get a better handle on its monthly water bills.

And the same computer also processes all city taxes, tracks library books, matches car poolers, prepares bills for the health department and soon will handle municipal court schedules and a revitalized financial management system.

As a result of the combined efforts of the city's Water Division and the Management and Information Systems (MIS) department, Houston will collect $1 million more this year than would have been collected under the previous system, according to R. Bradford Thomas, director of Houston's MIS Department.

"Houston now receives an unprecedented 99.5% of all water funds owed the city, while saving the taxpayers' money and providing better customer service," he said.

Posting Time Halved

"We process approximately 20,000 transactions a day, valued at $200,000, through our Honeywell dual 6060 computer," he continued. "Within 24 hours – half the time it used to take – water payments are posted to customer accounts and relayed to the banks for credit into city accounts."

Fast turnaround of cash nets the city $2,000 in monthly savings, Thomas said.

"This seemingly insignificant amount from 600,000 payments has great impact when you realize it comes from a lower interest rate that is the result of an improved city credit rating," he said.

"To process revenues received by mail and from customers who pay In person, as well as to handle customer inquiries and signal start/stop of service, we installed a network of 47 additional on-line terminals throughout the Water Division. This expanded the total division network to 77 devices," Thomas said.

"Nine of the additional video display terminals, which help determine customer-requested up-to-the-minute account status, increased Water Division productivity more than 2,000 worker-hours per month," he said. "Of course, this also has increased customer satisfaction."

Not Always as Efficient

It wasn't always as timely or as efficient, Thomas said. Just before he joined Houston as director of the MIS Department, Mayor Fred Hofheinz and the Houston City Council changed Water Division meter reading and billing cycles from every two months to every month. And later, In what the mayor termed "a hard, unpopular, but necessary decision, the drain on the city's general fund was removed by putting our water system – Houston's largest utility – on a self-sustaining basis."

These actions made everyone realize that operating procedures developed In 1964 weren't applicable in 1974, Thomas said.

"By January 1975, after a major Water Division reorganization, we installed the additional video display terminals and revised the Water Division's computer usage. Computer programs and procedures were improved and updated as rapidly as possible," Thomas said.

Other savings-oriented measures taken at the same time involved replacement of more than 50,000 old meters with easier-to-read, more accurate devices and the creation of a meter-reading school. "Both moves have increased meter reading accuracy to 99%, a considerable improvement," Hofheinz added.

Looking at Other Areas

"Today, besides plans to include more on-line management control for the division, we are looking at other areas of the Water Division for ways the computer can assist in increasing overall effective performance," he added.

Similar activities are being initiated throughout the city of Houston. Various departments, working with management and information systems, have a key role in the efforts of Hofheinz to implement procedures that prove government can benefit from sound management techniques applied to municipal problems.

"Houston's city government – with a budget of $333 million and 14,000 employees – is a big business," he said. "In addition to improving Water Division operations, we modernized the city budget to make this highly visible facet of municipal management a planning tool for city officials as well as a meaningful source of public information.

Schedules Projects

"Houston also has reestablished a capital improvement program that reflects and schedules two-year construction projects," he continued. "Developing the program required department heads and officials to assess needs realistically, weigh resources and determine priorities."

Similar attitudes and techniques have made the MIS department a workable utility for the city as well, Thomas said. "The department was created to coordinate information and data processing among city departments, a move in itself that has realized substantial savings of tax dollars," he said.

Moving Facility

The MIS department is moving to a new, expanded facility. The 37,000-sq-ft area of the Municipal Courts Building designated for MIS personnel and related equipment was designed to contain Houston's full-scale computer operation.

Included in the move will be the Honeywell dual 6060 large-scale computer system with 512K words of main memory, three printers – two attached with OCR-A to print control numbers on water bills, two Datanet 355 front-end network processors to provide communication links with more than 140 remote terminals, eight Honeywell tape drives and 16 190B disk drives with a capacity of 1.9 billion characters.

Also to be moved will be all the necessary peripheral equipment, such as the Lundy-Farrington optical scanner, used to process the paid water bills.

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370/158 memory

Interdata Extends 16-Bit Line at Top and Bottom

By Esther Surden
Of the CW Staff

NEWTON, Mass. – Interdata, Inc. has introduced two minicomputers models which round out the firm's offerings at the top and bottom of its 16-bit product line.

The low-end Model 5/16 was primarily designed for incorporation into OEM systems and for use by systems builders. It is comparable to the Digital Equipment Corp. LSI-11, a spokesman said in an interview here.

The Model 8/16 can be compared to the DEC PDP-11/34 and was designed for both OEM and end-user applications, he said.

The 5/16 with 8K bytes of NMOS memory costs $868 in 100-unit quantities, Interdata said. A comparable 8K-byte LSI-11 costs $634 in the same quantity, a DEC spokesman said.

The basic 8/16 with 32K bytes of memory costs $4,160 in quantities of 10. The 32K-byte PDP-11/34 costs $9,290 in single-unit quantities, DEC said.

The 5/16 is contained on a single printed circuit board and includes an Interdata 16-bit processor with 16 general-purpose registers and 114 instructions.

Up to 64K bytes of 600 nsec random-access memory can be accommodated on the board. The processor also features direct memory addressing up to 64K bytes, the Interdata spokesman said.

The 5/16 is both software- and peripheral-compatible with other members of the Interdata 16-bit family line, he said.

The 5/16's bus structure includes both the standard Interdata multiplexer bus found on the other members of the line and a Micro Bus, introduced at the National Computer Conference recently.

The Micro Bus is compatible with the I/O buses of the Intel 8080 and Motorola 6800 microcomputers, allowing the CPU to be interfaced to micro-controlled devices, the firm said.

The top-of-the-line 8/16 adds single- and double-precision floating-point hardware to an Interdata 16-bit CPU for the first time, the spokesman said. Previously these functions were performed by firmware, he noted.

Typical double-precision floating-point times are 5.7 µsec for an add and 17 µsec for a divide, he said.

The 8/16 features 16 general-purpose registers and direct memory addressing; it supports up to 64K bytes of 750 nsec core memory.

The 8/16's core memory features a 275 nsec access time, a speed faster than that previously available on the firm's 16-bit systems, the spokesman said.

Both the 8/16 and the 5/16 run under the firm's OS/16 MT multitasking operating system.

The 5/16 processor, 8K memory enclosed in a five-slot chassis with a 25A power supply and current loop interface costs $1,395, the firm said.

The 8/16 in a 16-slot chassis with a 50A power supply; hexidecimal display panel; 60 Hz clock; power fail/auto restart; operating system bootstrap loader; single- and double-precision floating-point hardware; and disk and teletypewriter interfaces costs $16,761.

Interdata is at 2 Crescent Ptace, Oceanport, N.J. 07757.

Basis of Dispatch System

Minis Cut Emergency Response Time of Boston Police

BOSTON – Shortened response time to emergencies was the goal of the Boston Police Department here and that goal has been met through a Computer-Aided Dispatch (CAD) system using minicomputers, according to Joseph Sarno, the department's DP director.

The CAD system, which reptaced a manual complaint-taking and dispatch system, consists of two Data Generat (DG) Eclipse S/200 computers with 88K bytes of core memory.

Each system has two 25M-byte disk units, an 800 bit/in. magnetic tape drive, paper tape reader, t65 char./sec and 300 line/min printers and dual access asynchronous line multiplexers to interface the system's 37 CRT terminals. One system is on-line, while the other runs in a "watchdog," backup mode.

A request for proposals based on visits to other cities with computerized dispatch systems drew a response from Arthur D. Little Systems in Burlington, Mass., which recommended DG as the hardware vendor. Cost for the system was about $360,000; software costs totaled about $260,000, Sarno said.

In the 911 Operations Center, 14 complaint clerks handle some 3,500 telephone calls a day from citizens who dial 9t1 to report emergencies.

Each clerk's CAD workstation consists of an interactive CRT terminal on-line to the minicomputer. As calls come in, they are automatically switched to the first available clerk, who asks any pertinent information.

With the manual system, the ctcrks wrote this information on a punch-type card, then checked a lengthy computer printout of all Boston streets to detcrmine if the incident's location was a valid address and find the corresponding police district and car sector.

After verifying the address, the clerk placed the card in a conveyorized trough

(Continued on Page 36)

Cincinnati Milacron Adds Series for DP, Offices

LEBANON, Ohio – Three series of small systems designed for single and multiple users in accounting, distribution and manufacturing applications have been introduced by the Cincinnati Milacron Co.

The 60 and 70 series systems are based on the firm's CtP/2200B CPU while the System 81 is based on a CIP/4400 CPU introduced with the systems, a spokesman said.

The systems range from smalt batch configurations with 5M characters of auxiliary storage to multiprogramming systems with 40M characters of disk storage, additionat tape and multiple data entry/inquiry CRT terminals.

Alt systems include the Cincinnati-Milacron Operating System (Cimos) with RPG-II, it noted.

The top-of-the line System 81 for multiuser DP applications includes a 960-character CRT console, an interface for up to eight additional CRTs and a 60-in. cabinet containing a 10M-byte fixed/removable front-loading disk drive and pack.

The System 81 CPU is thc CtP/4400, which features a memory management unit, disk initial program load, memory write protection, 50-hour battery backup, memory parity, real-time clock, stack facitity and hardware multiply/divide.

The unit accommodates 9-bit MOS memory and up to 96K can be housed in the system chassis. Cycle time is 800 nsec for 1 byte, according to the firm.

The Series 70 includes the System 70 and System 71. The System 70 was designed for single-user DP apptications while the 71 is intcnded for multiplc users.

Both systems include a CRT with front-loading disk drive, CIP/2200B CPU with front panel, direct memory access channel, MOS memory, five t/O ports for options, a printer controller with cable and a disk controller.

The System 70 is available with optionat printers, ranging in speed from 60- to 600 line/min and additional disk storage. Up to four magnetic tape units can be attached to the system.

In addition, the System 7t can have a maximum of eight 1,920- or 960-character CRTs.

The single-user System 60, tioused in a 30-in. cabinct for office applications, is also based on thc CIP/2200B CPU and can accommodate three additional tape drivcs and one CRT. The muttiuser System 61 can have up to eight CRTs and two printers, the firm said.

A basic System 60 with 32K bytes of mcmory and 5M bytes of disk costs $26,100; a 48K System 61 with 4M bytes of disk costs $30,300.

The System 70 with 32K bytes of memory and 5M bytes of disk costs $26,200; a 48K System 7t costs $30,400 with 5M bytes of disk.

The System 81 with 64K bytes of memory and 10M bytes of disk costs $42,800. The systems are available from thc vendor's Process Controt Division at Mason-Morrow Road, Lebanon, Ohio 45036.

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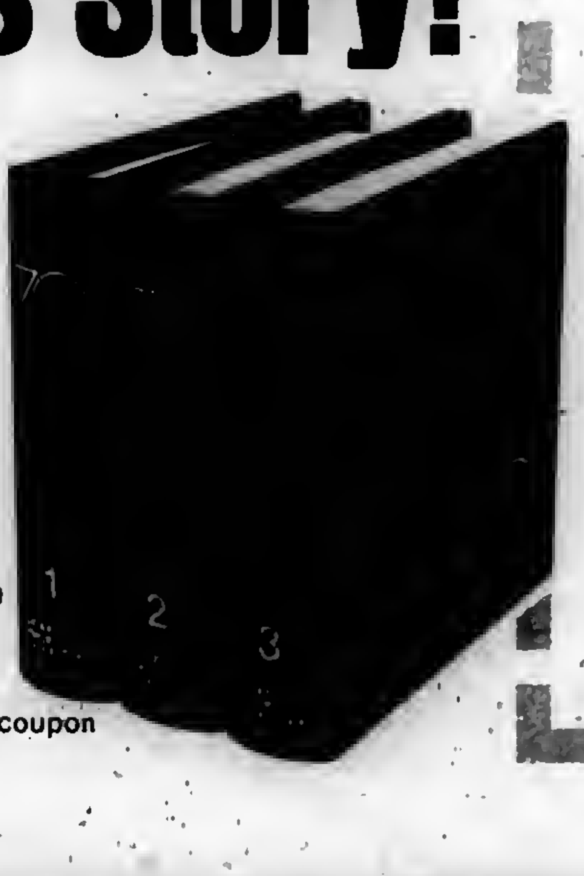

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Although Multivendor System Cheaper

Mini Maker as Single Source Called Users' Best Bet

By Jon David

Special to Computerworld

Minicomputer Exchange

On paper, a mixed-vendor system offers an end user the best of all worlds. He can select the exact equipment which best fits his present and anticipated requirements and get such equipment at the lowest possible price.

In practive, replacing the paper with the reality of actual business environments, there is often considerable difficulty in getting such systems to work and almost always significant problems in getting such systems maintained.

The growth of the peripheral equipment industry has enabled it to catch up to, and in many places surpass, the growth rate of the minicomputer industry. Today, if you operationally compared all minicomputers, you would find that they are effectively the same in probably 80% of all areas, are slightly different in another 15% of the areas and offer significant differences in only the remaining 5%.

In the peripheral equipment area, differences are much more meaningful and obvious.

Most minicomputer manufacturers do not make any peripheral equipment. A few make certain peripheral devices such as a disk drive or tape transport.

To remain competitive and be able to satisfy most requirements, the manufacturers offer comprehensive product lines to prospective users. They do this by selecting outside sources for peripheral equipment and integrating that foreign equipment with both their hardware and software.

You are visited by a computer salesman. He offers you a small disk, a medium disk and a big disk. As far as you are concerned, he makes these products. Although, in truth, you are actually getting a mixed-vendor system, one company, the computer manufacturer, is taking total system responsibility in both the hardware and software areas.

If part of the system you are considering is a Brand X line printer, you might find that you can go to Brand X and buy the same printer for less than the price charged by the computer manufacturer.

In some cases minicomputer manufacturers will let you do just that, provided you buy the interface/controller from the manufacturer, and they will still maintain all hardware and software; most, however, will not let you do this.

What Can Happen

The big problem arises when you want equipment not in the manufacturer product line. He may have, for example, disks that are either too small for your application or too expensive, printers that are either not powerful enough or too expensive or other equipment that just won't do your job.

You would like to use his computer and must, therefore, consider getting peripheral equipment from appropriate other sources. What can happen if you decide to put together the "best" system to satisfy your requirements?

You, being knowledgeable in such things, buy only peripherals that come with interfaces/controllers for your equipment and operating system software patches that will allow this equipment to be properly serviced by the manufacturer's software.

Let's say, for example, you buy a card reader, fully guaranteed to work. You get it, plug it in, turn it on and tell it to read cards. Wonder of wonders, it reads cards!

The Minicomputer Exchange is intended to be a means for users to present ideas about minicomputer problems and performance. Readers are invited to respond to this commentary or submit manuscripts about significant topics.

It reads cards so enthusiastically that it reads one more card than you told it to; you try it again and again and again and find that it still reads the one extra card each time.

Proven computer, proven card reader, proven interface – put them all together, they read one extra card. You don't think it can happen? It did to me.

Foreign disks, tapes, printers, video terminals, card equipment and other peripheral devices can always present problems when being interfaced to a computer. The problems need not be in hardware.

If, for example, you buy a bigger disk than a manufacturer supports, you may find that while the patches to his software may enable you to communicate with that disk, you can only communicate with the corresponding storage volume; what this means is you may have a 50M byte disk and only be able to access 10M bytes of it.

Getting System Maintained

Without trying in any way to minimize the problems involved in getting the foreign device to work properly, of far more importance to an end user is getting such a system maintained.

Your system, let us say, is down because you are getting continuous disk read errors. You call the disk company and it tests out its disk and interface/controller and shows you they are working perfectly; the computer manufacturer is then called, who similarly proves his equipment is perfect.

What then too frequently follows is a finger-pointing interchange. Obviously, you must get a single-source-maintenance vendor.

Independent maintenance contractors normally work on a time and materials basis. Since they do not have sufficient volume to justify the maintenance of adequate spare parts inventories, they frequently must get replacement parts from the manufacturer (normally at lowest priority), and since they often work on totally different equipment on different days of the month, it is hard to find them expert in your particular equipment set.

It is not uncommon, for example, to have an independent service vendor require an end user to furnish maintenance manuals so he might first learn the equipment before servicing it.

Is there anything you can do?

Independent systems companies often offer maintenance for systems they provide which are mixed-vendor systems and that are not serviced by the computer manufacturer. They either provide such service through an independent service company or actually maintain the equipment themselves.

If it is a custom systems house, it may provide different hardware with each system and cannot be properly qualified to maintain everything. If, on the other hand, it offers a product line attractive to you, at least you have narrowed down the product set with which it must deal.

Of course, if it goes out of business next year, you may have problems getting your system maintained; similarly, if it decides to utilize alternative products in the future, you may have some difficulty getting your present equipment maintained.

Most major minicomputer manufacturers offer extensive lines of peripheral equipment, even though they do not offer everything and offer almost nothing at the lowest possible price.

If you buy from such a manufacturer, you have a single and reliable source who will work with you to see that your entire system functions properly.

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and he is also president of Systems RDI.

Dual Minis Cut Response Time For Policemen in Emergencies

(Continued from Page 35)

which carried it to the dispatch area. There six police dispatchers, each handling two or more districts, picked up the cards, checked a card tub file which showed the availability of cars in each city district and then radioed the cars to the site of the incident.

Under the CAD system, the complaint clerks display a form with blank field on the CRT screen, type in the applicable information and assign a priority code to emergencies.

When the incident's location is entered, the system searches the address data base to verify address validity and assigns an incident number. If the address is valid, it displays the corresponding police district and car sector.

If the address given is invalid, it states the reason, such as "streets do not intersect."

A completed complaint is transferred to the appropriate radio dispatcher's CRT screen. Each dispatch position has two CRTs; one is interactive, the other displays the status of all cruisers, replacing the card tub file.

The dispatcher checks the display, radios an available car and then types the car number into the system.

If a caller calls again, the complaint clerk can tell the caller when the car was dispatched, Sarno noted.

As soon as a car is dispatched, a time counter in the system begins working and signals an alarm if a car has not reported its arrival at the location of the complaint within a predetermined time.

Operations Monitored

Between the 911 telephone area and the police dispatch area, communication supervisors monitor the CAD workstations of the complaint clerks and the dispatchers.

All incident messages are stored on the system's disk and can be retrieved by many of the complaint data fields, including incident number, location, nature and car assignments for status checks.

Complaint data is transferred to tape and sent to an IBM 370 for analysis daily.

The 911 dispatch system is the first phase of the CAD project. Next is the addition of stolen car information, arrest files, firearms registrations and hazardous locations to the on-line data base.

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CI Notes

Wyly Puts Datran on Block, Cites Need for More Cash

DALLAS – It's official – cash-hungry Wyly Corp. has declared its intentions to sell or seek a merger partner for its infant with the large cash appetite, Data Transmission Co. (Datran).

In addition, Wyly probably will revise its recapitalization program to require exchange of almost all of its 7.25% debentures and .4% capital notes into an undefined equity security rather than Wyly convertible debentures and common stock as announced last March.

Sam Wyly, chairman of Wyly Corp., said the market for Datran's digital transmission services is "growing rapidly.

"I have complete confidence that Datran will ultimately be a very successful business, but Wyly Corp. is unable to supply the additional capital needed to carry Datran to profitability," he added.

"We hope to find an American corporation with a desire to enter Datran's segment of the telecommunications market and an ability to invest," he said.

Wyly and Walter Haefner Holding AG of Zurich, Switzerland, have invested about $43 million and $47 million respectively in Datran. Any recapitalization plan will require participation by Haefner on terms that are under discussion, Wyly said.

CDC, NCR, CPI Charged In $36.7 Million Libel Suit

PHILADELPHIA – A $36.7 million suit filed here against Control Data Corp., NCR Corp. and Computer Peripherals, Inc. (CPI) charges the firms with libel and slander.

CPI, a joint venture of CDC, NCR and International Computers Ltd. (ICL), manufactures printers, card punches and tape drives.

The suit, filed by a Holland, Pa., computer parts supplier, John A. Bauer Inc., and by John A. Bauer Sr. and Jr., alleged the defendants, in the course of investigating whether CPI employees in the purchasing department were given "bribes, payoffs and kickbacks." began looking into the Bauer company last July.

According to the suit, the investigators told others the Bauer firm was "under intense investigation . . . for having paid kickbacks and bribes" and had made an improper payment of a least $110,000 to a CPI employee.

The suit also said the investigators suggested the Bauers were involved with prostitution, gambling and illegal drugs. The suit called all statements false.

CDC and NCR spokesmen reserved comment because corporate lawyers have not received copies of the complaint.

In Anticipation of Market

Disk Drive Vendors Adding Larger Units

By Molly Upton
Of the CW Staff

NEW YORK – Two trends evident among disk drive makers at the recent National Computer Conference here were anticipation of demand for 200M-byte to 300M-byte drives and the exodus from the IBM plug-compatible market.

Ampex Corp. has opted to emphasize the OEM market, as evidenced by its line of OEM drives. California Computer Products, Inc (Calcomp) has declared it will not compete head on with IBM-compatible products above the 3330-11.

Memorex Corp.'s philosophy in disk as in other areas is to offer IBM compatibility plus additional features.

Essentially all three have chosen not to compete head-on with IBM in the disk drive business.

" 'Big Brother' is a tough competitor," according to Clifford Leath, director of product marketing for Ampex Corp.

The firm has changed direction in its disk area from its start in end-user, IBM plug-compatible drives and now sells only to OEMs, he said.

Some of its OEM customers buy IBM-type drives, he said, but these are still OEM sales.

Winchester-Type Drives

In line with its OEM philosophy, Ampex does not offer any Winchester-type disk drives. However, if the mini manufacturers were to endorse the Winchester technology, Ampex would evaluate such a product, he said.

Diva Corp., whose drives range from 5M byte-1 spindle to 300M byte/spindle, also does not have a Winchester-type model. "We don't compete with IBM," Gary Beebower, director of marketing, said. But should the mini makers offer Winchester-type drives, Diva probably will also, he said.

Although several firms have recently unveiled 200M-byte to 300M-byte drives, the real demand in the marketplace is currently for the 80M-byte range, the exhibitors agreed.

Ray Crowder, product sales manager for Control Data Corp., said the 80M-byte is the most popular in terms of shipments, but the 300M-byte unit is the firm's fastest growing disk product.

However, he expects the firm's new 12M-byte and 24M-byte drives "will be real hot movers," he added.

"The 300M-byte unit uses the same interface and controller as the series that extends down to the 12M-byte unit," he said. The 12M-byte and 24M-byte units are Winchester-type technology while the storage module drive series are modified 3330-type and operate at 6,000 bit/in. and 3,600 rev/min which is faster than the Winchester, he said.

Diva's bread and butter sellers are its 50M-byte and 80M-byte drives, Beebower said. However, the orders are coming in for the 200M-byte and 300M-byte units as well, he said.

The larger units are transparent to the system, he said, so no input/output driver is required,

The independent disk makers products are all probably within $500 of each other, Beebower said. "It's a very cost-competitive area," he added.

Ampex's fastest growing item is its 80M-byte drive because the mini and large minis can readily utilize this size drive, Leath said.

The larger drives will be the most popular eventually, he said, but many users are not ready to utilize this capacity yet.

Ampex is also delivering substantial quantitities of its old 58M-byte 2314-generation drive, he said.

Memorex is seeing increasing demand for its 3300-11 type drive, according to Bob Booth, sales promotion manager. It's disks range from 5M-bytes to 200M-bytes, and business is increasingly OEM by intention, he said.

California Computer Products Corp. has shelved its plans for the development of a 400M-byte disk drive and has renounced its intentions of going after the IBM 3350 plug compatible market, according to a spokesman.

The firm fully intends to stay in the end user and OEM disk markets, he observed, and has several new products on the drawing boards at the moment, but those above the IBM 3300-11 in capacity will not necessarily be plug compatible with IBM units, he observed.

Hopefully the new systems will be able to be used with other mainframes as well as IBM, he said.

Adapso Committee Endorses Role Of Private Sector in EFTS Area

DEARBORN, Mich. – The potential expansion of the Federal Reserve Board into the Electronic Funds Transfer System (EFTS) process should be prevented, according to the Association of Data Processing Service Organizations (Adapso) Committee of EFTS.

In the minutes of its meeting here, the committee endorsed the role of the private sector in the development of EFTS and outlined three problem areas, one of which was expansion of the Automated Clearing House (ACH) system into switching network capability.

Committee Chairman William W. Fletcher said he intends to draft a position paper on behalf of Adapso regarding EFTS.

Other areas of concern to the committee are: legal liability and security and privacy issues.

On the expansion of the ACH system, the committee said it concluded the ACH system should remain established to oversee the contractual relationships among member institutions and to continue present check-clearing functions.

However, the private sector of the computer services industry is "best poised to man the computer processing function as it relates to a switch network with remote terminal functions.

"Thus the private sector should consider facility management possibilities or become directly involved in establishing centers to take over the direct deposit and other computer functions of the ACH," according to the committee.

Both the switch and an ACH should be independent, the committee indicated.

"The Federal Reserve should be stopped from becoming first involved with ACH as a switch and then expanding into network switch and then into the inevitable data processing related to EFTs," the committee said.

Unfair Competition Cited

The committee said it confirms Adapso's position with regard to banks involved in DP activities.

"The possibility of unfair competition, incremental marketing and tie-in will grow further under the EFTS structure if banks do not use third-party processors to fill the data needs," according to the group's minutes.

"Our committee is concerned that large banks are already influencing the design and structure of a switch network."

Also "the confidence in eventual solution expressed by the private sector should equal or exceed that of the federal regulators to prevent their automatic inheritance of the DP function arising from EFTS," the committee said.

"The fear and emotional aspects of EFTS should be positively addressed by Adapso so as not to discourage the National Funds Transfer Commission or private suppliers from permitting the ad-

(Continued on Page 41)

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Independent Competition Cited

IBM Operating System Unbundling Seen User Benefit

By Edith Holmes
Of the CW Staff

NEW YORK – Users would benefit if IBM unbundled, or priced its operating system software separately, as it did its applications programs in 1969, according to Jerry Enfield, president of The Computer Software Co.

The unbundling of "systems control programming," as IBM termed its "Type I" or fully supported software in the late '60s, would encourage independent suppliers of software to evaluate the possibilities of developing operating systems for IBM 360s, 370s and any future systems, Enfield said in his testimony in the trial of U.S. vs. IBM.

Believing independents would elect to compete in the development and marketing of systems software if IBM put a price tag on its work in this area, he anticipated lower prices would result, thus assisting users.

At present, though, independents will pick up operating systems manufactured by the industry leader only after IBM has declared them "functionally stable," Enfield said.

With that declaration, users and software houses know IBM will add no significant new features to subsequent releases of the systems software.

As long as additional releases containing new functions are distributed free from time to time by IBM, he said, operating systems will continue to be variable targets for independent software vendors.

There would be no way to ensure profitability, to be certain of a return on the development costs incurred to make available a facility IBM had not yet released, he said.

A Convenient Package

There is no technological reason for bundling operating system software today, Enfield said. Bundling simply makes a convenient package.

That convenience encourages users to look to computer system manufacturers to supply them with operating systems, he noted.

By including and maintaining operating sytems with the hardware, IBM has compelled other systems manufacturers to do likewise, Enfield added.

If operating systems were unbundled, users would have the option of evaluating software against software as they do when selecting hardware today, he said.

Unbundling operating systems would change the way in which systems are marketed, he maintained.

Took Stand on Unbundling

Employed by IBM from 1964 to 1969, Enfield was on the Implementation Task Force that devised the details and the actual announcement of unbundling of certain services on June 23, 1969.

At the time, he told the court, he argued the corporation should price all its software separately if it was going to take that approach with any of it.

Enfield left IBM for The Computer Co., formed in February 1969, just following the unbundling announcement. Joining the firm as vice-president of development, he was instrumental in the design of improvements to IBM's Disk Operating System (DOS) for the 360 series.

His improvements became The Computer Co.'s primary product – the Extended Disk Operating System (Edos) – early in 1972 following IBM's December 1971 announcement of plans to declare DOS functionally stable for the 360.

Edos served users of 370 systems in addition to those of 360 models until IBM came out with a new operating system providing virtual storage capability – DOS/VS – in the fall of 1972, Enfield recalled.

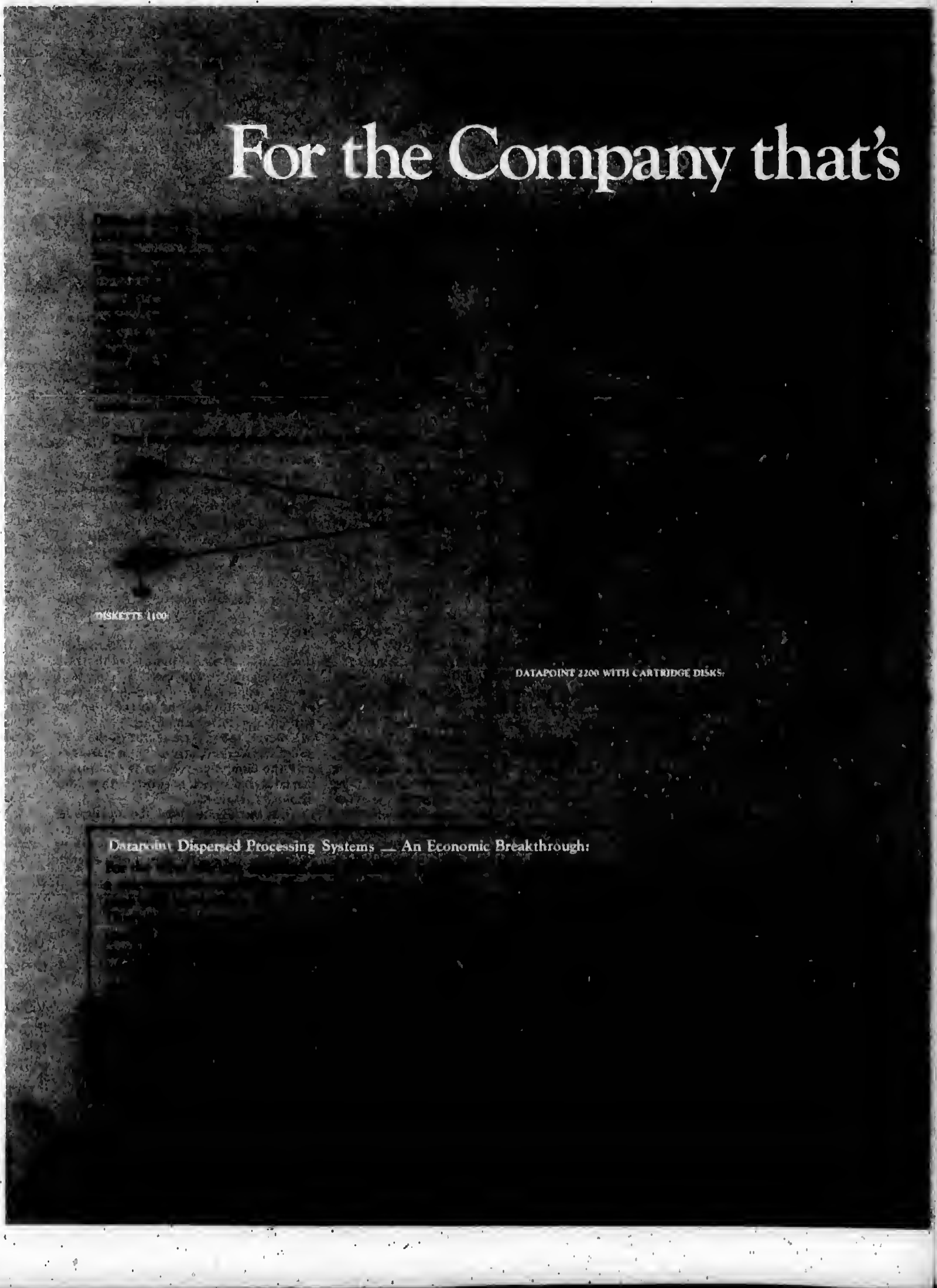
The Computer Co.'s Development Division, including Enfield, left the company on June 1, 1973 to form The Computer Software Co. The group took with it the rights to Edos.

Since then, Edos installations have grown from 25 to 30 in 1973 to some 350 today.

Prior to the formation of The Computer Software Co., 80% of Edos installations were on 370 machines, Enfield recalled; today 80% to 85% are on 360s.

Much of the Computer Software Co.'s success is because of its emphasis on marketing enhancements to users whose equipment IBM had ceased to support with continued new developments, he said.

Success was also the result of linking the marketing effort to that of leasing companies by encouraging those firms to enhance their 360 portfolios with Edos capability, Enfield said.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IBM Results 'Continued to Be Good' Through May

BOULDER, Colo. – IBM's operating results through May "continued to be good," following record first-quarter earnings and revenues, according to IBM President John R. Opel.

Addressing a group of securities analysts here, Opel said IBM is continuing to experience a "high rate" of outright sales of equipment in relation to leases, noting in Europe the rate of sales is "twice as high as in the same period in 1975."

IBM sales were at a record level in proportion to leases in 1975's fourth quarter and continued at a relatively high level in the first quarter, when net income rose nearly 25% to $544.4 million. Revenues during the same period rose almost 17% to $3.81 billion.

Opel credited inflationary pressures and tax credits for capital investment as the reasons for the maintained high level of sales, but added he didn't see any significant long-term effects on IBM.

"Thus far in 1976 all our operating divisions are doing very well indeed," he said. "All the indications are that these divisions will meet their objectives or come very close to them by the end of the year."

The General Systems Division (GSD), however, "is slightly below its sales plan, both in the U.S. and abroad," Opel said, but added GSD's pattern "is usually a slow first half year and a successful, whirlwind finish."

European Unit Results Up

Results of IBM's European unit were up 20% in 1975 and continue to make it "a star performer in 1976," the IBM executive said. Operations in Latin America, however, are not doing as well because of "nationalism expressed in import restrictions," he said.

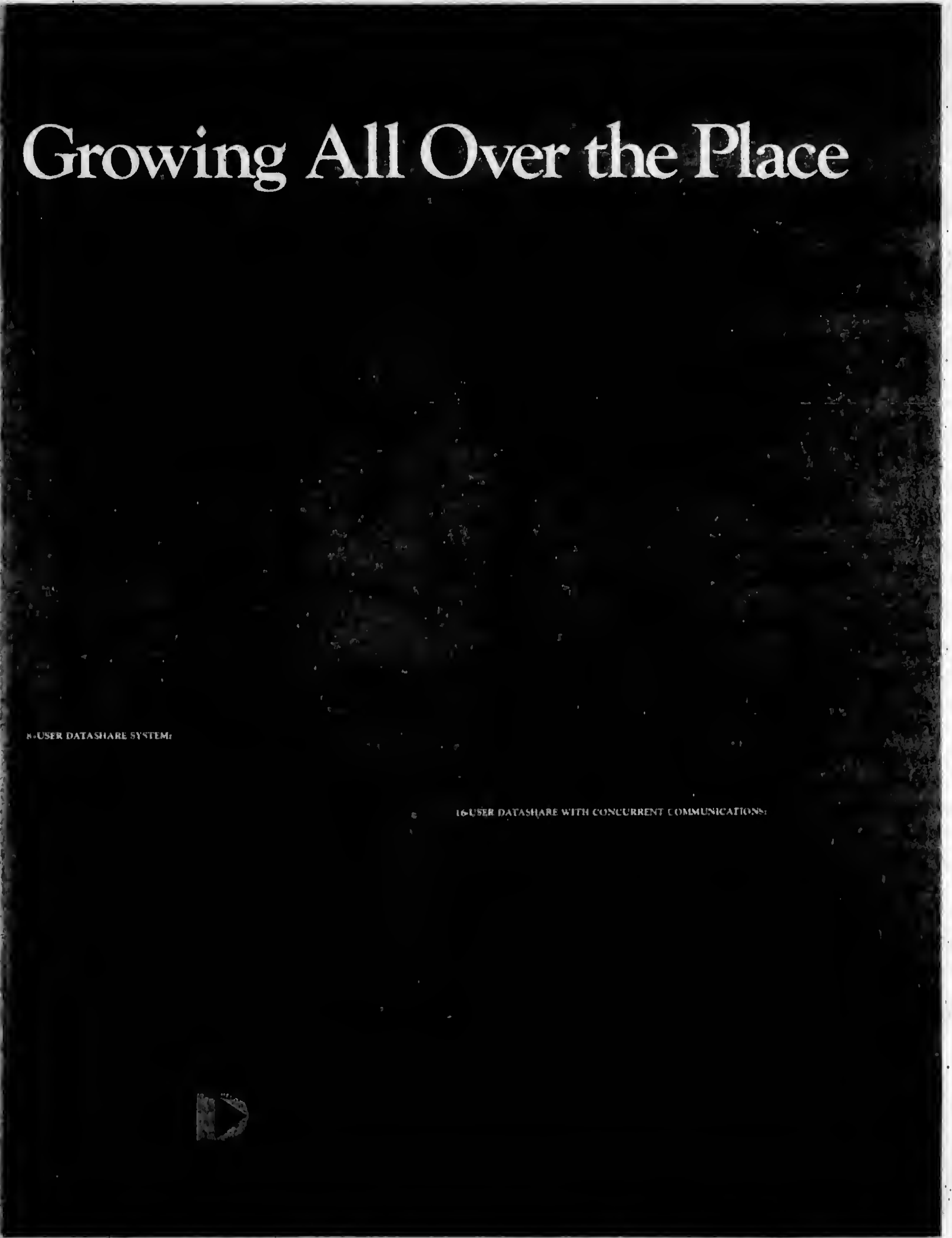
IBM continues to face increasingly tough competition, particularly outside the U.S. and notably in Japan where the government subsidizes its computer industry, Opel said.

With government subsidy, IBM's Japanese rivals "can settle for profit levels below anything tolerable to a risk-taking, open competitor," he added.

However, IBM's Japanese subsidiary "continues to do very well," Opel said.

Economic nationalism is developing in Europe too, but IBM's positions there remain strong, he said. There is nothing new to reports regarding a year-old investigation of IBM's operations by the Common Market, Opel added.

IBM's directors will decide the next dividend at their July meeting, after the quarterly report, rather than in June as in the past.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IBM Planning To Consolidate New York Plants

ARMONK, N.Y. – IBM plans to consolidate its Kingston, N.Y., manufacturing operations with other IBM locations by the end of 1978, turning over the Kingston site to the Systems Communications Division for a development center, the firm said.

The consolidation action affects about 1,000 employees, of whom 800 are expected to move to jobs in Poughkeepsie and East Fishkill, N.Y., and 200 are expected to choose to go to IBM facilities outside the area within the next three years, IBM said.

To supplement the Communications Division staff, about 150 people are expected to be transferred into Kingston.

As a result of intracompany transfer programs and an option for early retirement extended to Mid-Hudson Valley employees, IBM estimated about 1,000 employees will be leaving the firm's Mid-Hudson Valley facilities over the next three years.

The consolidation action is the result "of improved manufacturing efficiencies and continued advances in technology," IBM said.

The continuing trend toward denser, integrated circuits has reduced the need for some traditional manufacturing assembly operations and has made possible more efficient circuit testing, the firm continued.

The Kingston plant currently employs about 4,700 people, 3,700 of whom are in the System Communications Division development center.

Production of the 370/115 and -125 and the Model 2821 control unit will be moved to Endicott, N.Y., while the 3270 display system and the gas plasma display and its electronics will be made in Raleigh, N.C., IBM said.

The early retirement program is similar to that offered previously on a companywide basis.

Firms Form Consortium

TOKYO – Fujitsu Ltd., Siemens and Amdahl Corp. have agreed to establish a consortium for collecting orders in Europe for large systems, according to a report in *EDP Japan Report*.

The systems will be provided by Fujitsu or Amdahl and the orders for peripheral and terminal units will be shared among the three firms.

Improper Payments Spotted at Sperry

NEW YORK – A special review of Sperry Rand Corp.'s international operations uncovered improper payments totaling about $2 million, the firm said.

The total includes direct payments by subsidiaries operating in four foreign countries totaling about $1.3 million in connection with foreign government business.

Independent distributors and agents of a foreign subsidiary in another country may have paid up to $416,000 in connection with government sales, the review showed.

In six foreign countries payments of about $300,000 were made during the four-year period reviewed "to facilitate governmental administrative action.".

Shot at Close Range

Service Bureau President, Vice-President Killed

NEW YORK – The president and executive vice-president of a Long Island-based service bureau, Applied Systematics, Inc., were found shot to death in the company's Manhattan office recently.

A police spokesman said there are no suspects in the case.

Operations of the company have been assumed by Harold Gottfried, a member of the board who was named president. Salvatore C. Mineo Jr. was named executive vice-president.

The firm was founded about 1959 and went public in 1968, according to Gottfried. The company uses an IBM 360/40.

According to a report in the *New York Times*, the two men were found by a messenger at about 9 a.m., one slumped over a desk in one room and the other under a table in another room.

Police said there were no witnesses to the shooting, although another messenger heard "three bangs" about 30 minutes before the bodies were discovered.

Police indicated the men were shot at close range and "apparently knew their killer."

A former president of the firm, Joseph G. Cortale, was questioned in conjunction with the slayings, the article said.

Potter Units Reach Agreement On Terms of Debt Repayment

PLAINVIEW, N.Y. – Potter Instrument Co. and its subsidiaries, Potter Data Products Corp. and Potter Data Systems, Inc., have reached an agreement with the firm's general creditors committee for repayment of its debt.

The plan calls for settlement of about $9 million of claims covered by Chapter 11 for a combination of cash, notes and common stock.

Potter has been operating since April 1975 under Chapter 11.

Under the plan, those creditors owed under $300 would receive payment in cash. The others would receive 8% of their claims in cash and 12% payable in notes for 10 equal quarterly installments as well as Potter common shares for the remaining 80% of their claims at the rate of one share for each $2 of debt.

The plan must be approved by 51% of general creditors, "both in number and in dollar amount," and should be confirmed by the Bankruptcy Court, the firm said.

In addition, the plan is contingent on certain changes in the company, such as an increase in authorized securities, which requires stockholder approval.

Potter also owes about $20 million to institutional lenders which are secured creditors and aren't part of the Chapter 11 agreement. Since filing bankruptcy, Potter has repaid about $2 million to institutional lenders, the firm said.

The firm said unaudited financial information for the year ended June 30, 1975 "indicates substantial write-downs in inventory, off-lease equipment and other areas may be required."

ICL to Expand in U.S.

NEW YORK – International Computers (USA) Ltd. (ICL) plans to expand the geographic scope of its efforts in the U.S.

The timetable will be determined by the method chosen, either through acquisition or by itself, according to Eli Hiller, acting president.

For the moment, the firm is operating in the N.Y. metropolitan area, but has expanded its product line to include the 2904, which he said is in the range of the IBM 370/115 and -125.

MDS Forms Market Program

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) has formed a national/international accounts marketing program to be directed from its headquarters here.

The MDS program will provide a centralized focal point to more effectively support the hardware, software and service needs of MDS' accounts, according to an MDS spokesman.

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Second Fortune 500 Bruised Badly by '75 Recession

NEW YORK – The recession battered the second 500 largest industrials in 1975 as badly as it did the first 500, according to *Fortune* magazine.

Total profits for the Second 500 fell 12.8% in 1975; 57 companies on the list lost money, including Mohawk Data Sciences ($25.9 million loss), Bunker Ramo ($13.8 million), California Computer Products (Calcomp) ($13 million) and Electronic Memories & Magnetics (EMM) ($2.2 million).

The median return on stockholder's equity for the Second 500 was 11.2% vs. 12.7% in 1974. Memorex posted the highest return on stockholders' equity – 583%.

That figure reflects a very good year for Memorex, *Fortune* said, but it also reflects a shrinkage of the company's equity base during the prior four years of losses.

Telex was second in terms of return on stockholders' equity, but boasted a return of 70.2% in comparision with Memorex. Third in the second 500 was Sanders with a return of 63.3%.

The median in changes in sales for office equipment was the second highest in industrial categories, with a 12.1% rise. However, this same category ranked near the bottom in median changes in profits, scoring a 21.3% decrease.

DP newcomers to the second 500 in 1975 included Bunker Ramo at 513; Data General, 909; Telex, 944; Storage Technology; 969; and Data 100, 982.

Dataproducts was ranked in spot number 984, followed by Cubic, 998. EMM rounded out the slate at 1,000.

Departures from the listing included Ball Computer Products, Foxboro Co., Perkin-Elmer and Tektronix, all of which moved up to the first 500, and Hazeltine, which dropped off the end of the list after being 980 in 1974.

Behind Bunker Ramo, the computer industry leader in the second 500 at 513, Memorex rose 59 places to 541; Ampex dropped 38 to 551 and National Semiconductor rose 38 to 579.

Sanders followed at 673 and Mohawk Data Sciences was 705. Intel rose 12 places to 794 while Calcomp dropped 24 to 844.

Role of Private Sector in EFTS Endorsed by Adapso Committee

(Continued from Page 37)

vance in EFTS," it added.

Turning to the other problem areas, the Adapso committee said there needs to be "a clear understanding and expression of legal liability for errors or delay occasioned by errors contained on the magnetic tape which cannot be read by the Adapso member DP center . . . the interjection of DP servicing companies into the chain of electronic transfers of funds will require new legal and contractual study," the report said.

The committee said it intends to work with the Adapso committees on audit and privacy, but will avoid those controls that relate to personal identification, possible card duplication, release of personal ID numbers and other potential means of misusing a system.

Work in this area is being done by other committees such as the U.S. Savings League, the committee said.

"With respect to privacy considerations, the current avalanche of computer data on individuals and possible wrongful releases of such information will be amplified to the extreme in an era of electronic funds transfer," the group said.

In outlining the five stages of the growth of EFTS, the committee also enunciated its belief in the growth of the private EFTS sector.

The committee is concerned with transfers by means other than a printout or card punch.

The first stage is defined as any transfer from one account to another within a financial institution.

Stage two is transfer of financial information from sources external to the financial institution.

The committee envisions the third stage starting on a local basis, as opposed to a nationwide switching network first established by federal instrumentality or a utility.

The third stage is interchange of information among financial institutions.

From there, the next procedure is extension of financial institution functions to remote locations. The Adapso committee feels point-of-sale (POS) terminals should be accessible by all financial institutions.

The final stage is defined as "extension of retail data processing function to computers located in financial institutions or to the data servicers who service financial institutions or even possibly to the computers located at the switching centers."

The committee emphasized its intent to work with the National EFT commission in a positive approach rather than through negative position papers.

In response to a request from the commission for a profile of Adapso's membership, the committee has disseminated a questionnaire to that body.

Various members of the committee agreed to conduct further study in various areas including the need for remedial legislation to define branching authority to clear way for unmanned and POS terminals.

Other areas assigned were security, liability, the role of regulatory authorities and liaison with other EFTS interest groups.

Tymshare Expands in Europe

CUPERTINO, Calif. – Tymshare, Inc. has signed a memorandum of intent with Credit Lyonnais, a French bank, to acquire a 20% interest in Sligos S.A., a French DP services company, for about $3 million cash.

Tymshare also reached an agreement in principles to increase its equity ownership in its French affiliate, Cegos-Tymshare, from 20% to 45%, for about $1.1 million.

DP has a ubiquitous terminal condition.

A special report on *Data Communications Terminals* in the July 26th *Computerworld*.

The dollar value of the U.S. installed base of both general and special-purpose terminals should increase to $25 billion by 1980, *$20 billion of which will be shipped* in the next five yeors, (based on estimates by International Data Corporation, the world's largest EDP market research firm). Clearly, more users than ever before are relying on terminals to provide solutions to complex problems, while increasing the utility and accessibility of their computer systems.

Computerworld will present a special report on Data Communications Terminals in the July 26th issue, including teleprinters, CRTs and intelligent terminals. Edited by Ron Frank, this supplement will cover a variety of topics of importance to data communications users, with application stories and tutorials throughout.

For example, we'll report on how new carriers and carrier services might affect the way terminals are used. We'll look at what applications require terminals with "intelligence" - i.e., processing logic and memory - and show you some of the best ways to make use of this hardware. We'll investigate what's being done to make the terminal environment easier to use. This includes items on recent teleprocessing software enhancements and new hardware features, to name a few. In addition, we'll report on where terminals are headed, and analyze what's been happening to the cost of terminals.

If you're involved with data processing, this is one subject you may want to be very familiar with. Don't miss it. It's in the July 26th *Computerworld*. If you're a terminal manufacturer, you should advertise here. Don't miss the July 9th ad closing. Call your *Computerworld* salesman for more details. Or call Judy Milford at (617) 965-5800.

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Basic Timesharing Expects To Double Base in 1976

By Esther Surden
Of the CW Staff

SUNNYVALE, Calif. – While Basic Timesharing, Inc. has an installed user base of only 160 mini systems, the firm expects to ship 200 systems this year, according to Peter Johnson, market development manager for the firm.

The firm's dollar volume is growing at a rate of 50% per year and Basic has experienced a five-fold growth in personnel in the last two years, Johnson said in an interview here.

The firm began in 1968 as a time-sharing service with the owners developing new hardware and software. By 1970 they had a minicomputer system to sell, Johnson said.

The systems are in use in educational institutions and service bureaus, but the firm is thrusting into the commercial marketplace this year, Johnson said.

"Our skills are in putting together a time-shared system," Johnson said, and the firm offers no applications programs except those jointly marketed by Basic and its customers, Johnson said.

"Until recently the typical user had to have a computer background and had to know about application programming to understand the unique qualities of the system," Johnson said.

However, with the parallel marketing of applications packages, Johnson feels this all will change. The firm is presently joint-marketing a data accounting package developed by one of its customers and a school administration package, he said. The firm intends to market more of these in the future.

Many of Basic Timesharing's customers want to do their own jobs and go into the service bureau business on the side, Johnson said.

Software updates are performed on the system every three months, Johnson said, and customers are encouraged to take advantage of new software releases.

Service on the system is handled remotely, he continued. Basic dials into the system over telephone lines and runs the diagnostics.

If a patch is needed, it can be installed over the telephone, and if a hardware part must be replaced, Basic ships it to the user and it can be replaced with relative ease, he said.

The operating system is Basic's biggest contribution to the system, Johnson said. The user has "no access to the source code of the operating system," he added.

A unique advantage to the application software vendor is that "just as we can dial into the system from here to do diagnostics, we offer a similar capability to the applications software vendor," he said.

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Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

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Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

1. **Data Communications Course #1010 — Practical Data Communications Systems and Concepts.** Led by Dr. Dixon Doll, this two-day seminar is designed for people who are relatively new to data communications. It presents you with a comprehensive exposure to the important terminology, economic aspects, and functional characteristics of contemporary data communications devices, techniques and systems. Money-saving ideas are an important part of this seminar, and you will see how to implement them using innovative techniques like split-stream modems, diagnostics for fault isolation, modem-sharing devices and digital bridges, remote multiplexers/concentrators, and front-end preprocessors. The seminar will focus on the latest developments in data communications, such as SDLC, IBM's new Synchronous Data Link Control, DDS, Bell's new digital data network, and HID-LoD, Bell's newly effective tariff for voice lines. And we'll look at the impact of satellite carriers and specialized carriers as well. This seminar will give you the ability to recognize and solve specific problems in data communications so that you can effect cost savings and performance improvements at your installation.

2. **Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design.** Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Close study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own.
Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithims for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

To enroll, look over the schedules below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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Brazilian Firm Threatens to Sue Cincom As License Contract Dispute Continues

By Donald Best

Special to Computerworld

SAO PAULO, Brazil – Although Cincom Systems, Inc.'s attorney maintains the license contract between the software vendor and Deltacom, Sistemas de Informacao S/C Ltd. was canceled in January, Deltacom has indicated it is prepared to take legal steps to defend the validity of the license.

Cincom's attorney in its U.S. headquarters said the Deltacom position is totally without merit. The agreement between the two firms provided for 30-day cancellation by either party, which Cincom chose to exercise in mid-December, he said.

Cincom has since appointed Sistemas, Computacao e Informatica as its Brazilian representative [CW, June 7].

The Cincom attorney indicated much of the problem between Cincom and Deltacom, formerly known as Deltacom do Brasil, stemmed from a lack of reports on installations of Cincom software made by Deltacom.

Deltacom has notified 33 of its clients about its intention to file litigation against Cincom and present documentation claiming the original license agreement signed between Cincom and Deltacom on May 1, 1973 is still "valid and binding."

Under the terms of that contract, Daltacom was named Cincom's representative with exclusive marketing and service rights to all Cincom products in Brazil.

Royalty payments were to be remitted to Cincom in the U.S. based on a fixed value per product equivalent to 50% of the U.S. sale price regardless of whether the software was sold, leased or rented in Brazil.

Royalty Snafu

Ivan T. George, president of Deltacom, said in an interview that "royalty payments were not, in fact, carried out, because approval could not be obtained from the National Institute of National Ownership (Inpi)," the agency which, together with the Central Bank, approves the remittance of royalties in all cases designated "transfer of technology."

According to the correspondence circulated among Deltacom clients, Inpi refused to classify the importation of software as "transfer of technology" and declared instead that such transaction "characterizes a sales representation with commercial aspects."

Under these conditions, George said, Deltacom "cannot make royalty remittances abroad without Inpi registration.

"Deltacom's inability to make royalty payments at this time," George said, "does not represent a breach of our contract with Cincom because current Brazilian law makes the execution of the royalty clauses impossible."

Cincom has cited Deltacom in a judicial summons in Sao Paulo, claiming Deltacom owes back royalties of $521,278.

Foreign Orders & Installations

Bank of Credit and Commerce International SA has ordered two NCR Century 151 systems for the bank's main office in London, two Century 151 processors and visual display units for use in Abu Dhabi and two Century 8200 minicomputers for use in branch offices in Teheran and Beirut.

DAF Trucks N.V. of Eindhoven, The Netherlands, has ordered a Production IV manufacturing management system from Informatics, Inc.

F.W. Woolworth has ordered two computerized retail systems from NCR, including 56 NCR 255 terminals, two NCR 726 in-store minicomputers and four NCR 250 electronic cash registers, for two Woolco stores opening in the UK.

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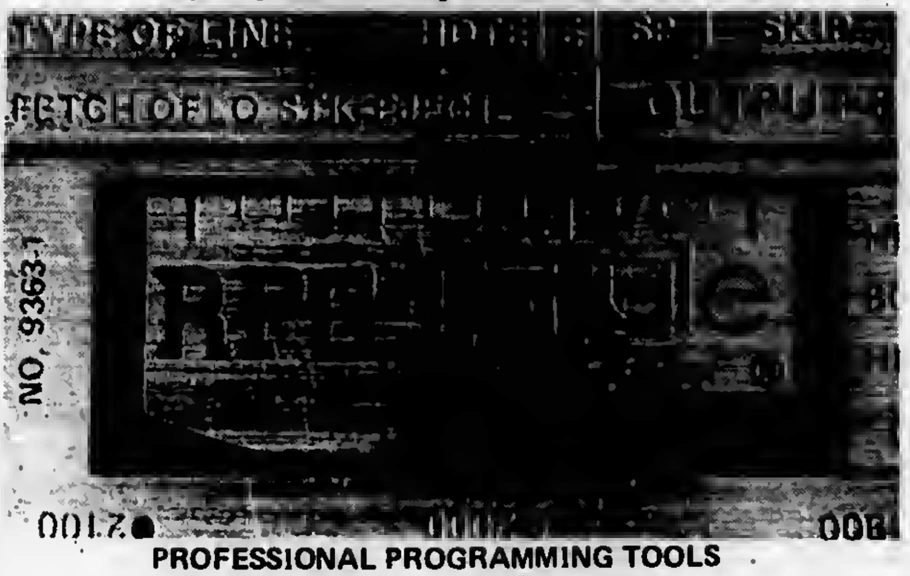

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The $4.4 Billion German Computer Market And How To Reach It:

The German computer market is the largest in Europe and the third largest in the world. In 1976, German computer users will spend an estimated $4.4 billion for data processing. Studies show that the 5,000 largest EDP user sites account for 65% of this spending, so like the United States, Germany's computer market is highly concentrated in the larger, professional computer sites.

IDC Deutschland (one of Germany's largest market research and consulting firms) projects that the average growth rate of computer systems sales in Germany will be 14% through 1977; but the growth of certain segments of the market will be much greater. The rate for minicomputers and data communication terminals will be more than 30%. Software and services will experience an annual increase of 20-30%, while data entry equipment is expected to show a sales increase of 25% per year.

Computerwoche, the EDP weekly for the German computer community, reaches the people who control the computers in this $4.4 billion market. With a circulation of 21,000, *Computerworld's* German sister publication, serves German DP professionals with the same editorial excellence that has made *Computerworld* a leading EDP publication in the United States.

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1980 Mass Memory Mart Predicted at $2 Billion

SANTA CLARA, Calif. – "By 1980, mass memory storage of archival information could be a $2 billion a year market," predicted Charles Missler, chairman of Precision Instrument here, which has developed a laser mass memory.

Because of both the performance and cost benefits, "we expect permanent storage to make a large dent in the computer memory market for large installations," Missler said.

The unused computerized files in this country are costing big business and government "an arm and a leg," he continued.

Tapes Not Inexpensive

In fact – and most executives don't know – magnetic tape is as expensive as the paper it replaced for archival storage of data, Missler said.

Tapes are expensive to maintain, degrade over time and are vulnerable to loss, error and malicious mischief," he explained.

"The manpower and errors that result from magnetic tape are one of the major costs associated with DP," he added.

In addition, a magnetic tape reel that costs only $10 in large bulk quantity purchases can cost as much as $20 to $25 per year when all expenses are tallied, he pointed out.

These include tape librarians, the cost of leasing special air-conditioned and filtered office space, error corrections and rehandling to avoid tape deterioration, Missler said.

Precision Instrument's memory storage media is both cheap and permanent, he said.

Instead of a recording head, a finely focused laser beam shoots permanent, nonerasable microscopic holes into a thin film of Rhodium on a polyester sheet called a Data Strip, he explained.

"Using such a method, 200M bytes of information can be stored for $22 as opposed to over $100 for the same amount of data on a magnetic tape reel," he said.

"But the major advantages are the additional savings because reels do not have to be changed or maintained."

Such mass memories can be used for data and/or graphic illustrations and the cost differential is so great that it is less expensive to record again all of the information on disposable Data Strips, he observed.

"You would still come out way ahead," Missler claimed.

Permanent Memory Benefits

"Traditionally, the industry has been limited to erasable memory such as magnetic tape or disk and has assumed that a permanent system would be a disadvantage.

"But now, people are coming to recognize the benefits of permanent memory, since it is not subject to alteration by a disgruntled or dishonest employee, or to inadvertent erasure due to human error, power failure or equipment malfunction," he continued.

Laser mass memory technology has been up and running in classified government applications and has just been released for commerical uses, he noted.

Earnings Reports

SPERRY RAND
Year Ended March 31

	1976 (000)	a1975 (000)
Shr Ernd	$4.00	$3.54
Revenue	3,202,556	3,040,862
Earnings	145,294	b125,233
3 Mo Shr	1.08	1.04
Revenue	894,597	823,237
Earnings	41,187	36,773

a-Restated to reflect accounting change for translations of foreign currency. b-Includes $5.44 million gain on sale of land.

STORAGE TECHNOLOGY
Three Months Ended March 26

	1976	a1975
Shr Ernd	$.33	$.26
Revenue	27,343,000	20,410,000
Earnings	1,406,000	1,046,000

a-Restated.

T-BAR
Three Months Ended March 31

	1976	1975
Shr Ernd	$.16	a$.14
Revenue	1,305,207	1,102,100
Earnings	85,404	73,071

a-Adjusted for five-for-four stock split in April 1976.

TALLY
Three Months Ended March 28

	1976	1975
Shr Ernd	$.19	$.01
Revenue	6,112,000	4,432,000
Tax Cred	378,000	35,000
Earnings	658,000	28,000

TECHNITROL
Three Months Ended March 31

	1976	1975
Shr Ernd	$.20	$.16
Revenue	5,117,000	4,432,000
Earnings	a264,000	214,000

a-Includes $59,000 from sale and revaluation of investments.

TEXAS INSTRUMENTS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.93	$.61
Revenue	369,367,000	332,757,000
Earnings	21,287,000	13,992,000

TRACOR
Three Months Ended March 31

	1976	1975
Shr Ernd	$.66	$.46
Revenue	27,852,000	22,995,000
Tax Cred	652,000	528,000
Earnings	1,698,000	1,123,000.

VARIAN ASSOCIATES
Three Months Ended April 2

	1976	1975
Shr Ernd	$.32	$.28
Revenue	85,145,000	76,893,000
Earnings	2,257,000	1,917,000
6 Mo Shr	.55	.49
Revenue	164,117,000	149,582,000
Earnings	3,916,000	3,379,000

WANG LABORATORIES
Three Months Ended March 31

	1976	1975
Shr Ernd	$.21	a$.03
Revenue	22,947,000	17,413,000
Earnings	1,102,000	170,000
9 Mo Shr	.64	a.35
Revenue	65,195,000	51,309,000
Earnings	3,263,000	1,785,000

a-Adjusted to reflect common stock dividend on April 9, 1976.

WANGCO
Three Months Ended April 3

	1976	1975
Shr Ernd	$.50	$.10
Revenue	8,162,105	4,279,620
Earnings	552,619	110,161
6 Mo Shr	.96	.31
Revenue	15,200,358	9,080,773
Earnings	1,060,287	324,253

TYMSHARE
Three Months Ended March 31

	1976	1975
Shr Ernd	$.39	$.31
Revenue	18,443,597	14,034,946
Tax Cred	.....	100,000
Earnings	1,583,092	1,185,266

WESTERN DIGITAL
Three Months Ended April 3

	1976	1975
Revenue	$2,101,000	$2,844,000
Loss	433,000	752,000
9 Mo Rev	7,605,000	8,399,000
Loss	1,569,000	1,212,000

POSITION ANNOUNCEMENTS

EDP Opportunities

SOFTWARE Design NYC - real time telex switch architecture $23-27M
IMS Specialists-NY/NJ/CONN-IMS O.C./OL1 $20-23M
PROJECT Leader NYC-STK transfer-EFTS-EMP Bnfls $21-23M
PROG ANAL-BAL/OS banking, deg. $18-21M
PROG ANAL-NY/NJ BAL On line commercial applications $17-21M
SOFTWARE-NY-OS/MFT-MVT. HASP 3.1-4.0 $21M
SYSTEMS ANAL PROG-CONN-learn IMS OS deg $17-20M
OPERATION RESCH Prog Anal-Fortran/Basic $15-18M
PROG ANAL NY-institutional invest bond/equity 360 DOS COBOL $17-19M
PART TIME Progs-NYC-20 hrs. weekly $8 to $9 per hour
Bill Borrelli (212) 349-3610

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position announcements

Computer Technology Faculty Position

The Purdue University School of Engineering and Technology at Indianapolis is seeking candidates to fill a position in the Computer Technology Department at the Assistant Professor level beginning January, 1977. M.S. degree and five years of relevant teaching and industrial experience required. PH.D. desirable. Position responsibilities include full-time teaching in Associate of Applied Science and Bachelor of Science curricula. General systems experience is preferred. Some expertise in minicomputers/microcomputers would be helpful.

Applications must be received by August 31, 1976. Send to:

Dr. Robert G. Crozier, Purdue University School of Engineering and Technology, Indiana University-Purdue University at Indianapolis, 1201 East 38th Street, Indianapolis, Indiana 46205.

THE OLDEST LIFE INSURANCE COMPANY IN AMERICA

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Mr. Robert M. Meeker
**Presbyterian
Ministers' Fund**
1809 Walnut Street
Philadelphia, Pennsylvania 19103

position announcements

SR. PROGRAMMER/ ANALYST

Major financial institution in search of an individual with one or more years OS/DOS COBOL experience. IMS or AL would be a plus. $15,000 FEE PAID.

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12 S. Main Street
Memphis, TN 38103
(901) 523-8950

Senior Software Specialists
GERMANY

The German subsidiary of one of Europe's largest software consulting and data processing service companies has an immediate need for senior level personnel in its consulting division. Experience in systems programming, the design and development of operating systems, teleprocessing, large-scale multi-CPU communications networks, or minicomputers is required. Preference will be given to those who have knowledge in German. Attractive compensation package and moving expenses are provided. Moderate travel and periodic relocation within Germany is to be expected. Please forward your resume and salary history to

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CACI, Inc., the established 14 year old international leader in Database Consulting is seeking Senior Systems Programmers, Systems Engineers and Independent Consultants with in-depth experience in Database – preferably IMS. There are a variety of exciting Database assignments in Italy, Spain, France, Scandinavia and Britain involving performance monitoring, Database and TP systems tuning, evaluation of competitive systems, and complex Database design. Excellent salary, liberal expenses + profit sharing.

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INTERNATIONAL**
75 Rockefeller Plaza
New York, N.Y. 10019

C.A.C.I.

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WVI is a Christian humanitarian organization dedicated to overseas ministries in childcare, social action, leadership development, emergency aid and evangelism. WVI currently has openings for three positions. You would work in a challenging environment with Christian data processing professionals.

ANALYST/PROGRAMMER

Senior level person to aid in the development of an on-line system for a new DECsystem-20 configuration. Desirable experience is at least five years in development, COBOL programming and implementation of large projects. Experience with data base administration is a definite plus.

SENIOR PROGRAMMER

This position requires five years experience with both financial and management systems plus COBOL programming. Experience with MSA general ledger and on-line systems is a definite plus. This person would support the MSA general ledger system on DOS and help design and implement future financial and management systems for a DECsystem-20.

ASSISTANT MANAGER OF DATA ENTRY AND MAIL HANDLING

Challenging opportunity to assist the manager of a department of 60 people. Responsibility includes data entry, mail handling and analysis. Desire some technical knowledge and some experience with an on-line system. Must have ability to manage people.

IMMEDIATE OPENINGS

Qualified applicants should send their resume to:
Al Trussell
Director, Data Systems

World Vision International
919 W. Huntington Drive
Monrovia, CA 91016

PROGRAMMERS PROGRAMMER/ANALYST

Large financial institution is currently seeking qualified programmers and programmer analysts to support our needs for new commercial applications.

We offer an excellent Mid-Atlantic location, competitive salaries and a comprehensive fringe benefit program as well as a state-of-the-arts environment utilizing IBM 370/158 hardware. OS/VS-1, programming predominantly in Cobol. T/P exposure helpful but not essential. Two years practical working experience required. If you qualify and are interested send your resume, indicating salary history to:

D.T. Leonard
First & Merchants Corporation
P.O. Box 27025
Richmond; Virginia 23261

FPL
FLORIDA POWER & LIGHT COMPANY

SYSTEM PROGRAMMER UNIVAC SERIES 70

Florida Power & Light has an immediate opening in the Computer Systems and Programming Department in Miami.

Candidates must have a minimum of five years programming experience of which two years were supporting VMOS or VS9 software and program products, SYSGEN experience on VMOS 10 or VS9, experience in configuring and managing Disk Space in a time sharing environment, and be proficient in ASSEMBLY language. Knowledge of COBOL and FORTRAN language is desirable.

We offer an attractive geographic location, career potential and an excellent benefit program.

Qualified candidates who wish to be considered for the above position should submit a personal resume including salary history in confidence to:

A. M. STRICKLAND
FLORIDA POWER & LIGHT COMPANY
P. O. BOX 013100
MIAMI, FLORIDA 33101

AN EQUAL OPPORTUNITY EMPLOYER M/F

PROGRAMMER/ ANALYSTS

Mallinckrodt, Inc., a broadly diversified pharmaceutical and chemical manufacturing corporation, is searching for achievement oriented programmer/analysts to meet rapid growth requirements within our Management Information Services Division.

We are seeking user-oriented people with applications experience in financial, manufacturing or marketing areas. Desired background includes 2-5 years experience in a systems and programming group, a college degree and a working knowledge of ANS COBDL.

Mallinckrodt is a rapidly growing corporation with terminals currently installed in four of our eighteen domestic manufacturing facilities. Installed system is a 370/145 using DOS/VS.

We offer an excellent starting salary, comprehensive benefits programs, including a dental program and a liberal relocation policy.

Qualified applicants please send resume including salary history to Mr. J.N. Hoganmiller, Corporate Employment Department

Mallinckrodt

P.O. Box 5439 St. Louis, Mo. 63147

An equal opportunity employer, M/F

Senior Systems Programmer

The University of Missouri Computer Network is seeking a qualified individual to join the basic systems programming staff. Basic duties will include integration, installation and maintenance of major applications systems including SPSS, SAS, MARK IV, LIBRARIAN, etc., and participation in the continuing evolution of the Computer Network's operating system.

The University of Missouri Computer Network serves the entire general purpose computing needs of the four campuses of the University and various outside organizations. Service is provided by an IBM 370/168 and 370/158 operating under MVS-JES2 with MAS, and supporting TSO, IMS and ATS.

Applicatns must have a bachelor's degree and three to five years of appropriate experience. (Candidate not having a degree must have a total of at least seven years applicable work experience.) Ability to communicate with user oriented computer professionals located on the four campuses is also necessary.

Send resume to: University of Missouri - Columbia, Personnel Services, 309 Hitt Street, Columbia, MO 65201. *An Affirmative Action/Equal Opportunity Employer.*

PROGRAMMER SYSTEMS

System support position available at our general offices in Minneapolis. Work experience with IMS internal code, OBO/PSB gen or MFS required. Data dictionary experience helpful. Starting salary based on applicable experience. Excellent fringe benefits including air travel. Send resume detailing above experience to:

Industrial Relations
North Central Airlines
7500 North Liner Drive
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Requires 3-5 years experience coding COBOL in a business environment. Must be able to analyze business problems and develop system definitions and program specifications. Must be proficient in job control and program debugging.

Apply or send resume to:

Personnal Director
The Zia Company
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Heavy experience in IMS DL/I Applicant must have general accounting in large company environment. Oil accounting experience or refinery experience beneficial. IBM OS/VS experience required. Excellent salary and overseas benefits.

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Requires 2 years of IMS experience.

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(213) 380-2200

CO-ORDINATOR OF ACADEMIC COMPUTING SERVICES

Academic Staff position at University of Wisconsin-Platteville. Responsibilities include the coordination and promotion of computer use by various departments and colleges and the supervision of the Academic Computing Systems (DEC PDP 11/40, IBM 1130, and RJE Remote to IBM 370). The applicant should have a M.S. degree in Computer Science or a related area. Experience in timesharing is desirable. UW-Platteville is an equal opportunity employer. Interested persons should send a complete resume and reference no later than July 15, 1976 to: F.J. Lofy, Chairman, Search & Screen Committee, University of Wisconsin-Platteville, Platteville, Wisconsin 53818.

ASSISTANT MANAGER
Data Processing Center

The National Academy of Sciences is seeking an individual with management capability as well as extensive systems programming experience to work with installed IBM 370/135 computer system with video terminals operating under DOS/VS utilizing CICS and ATMS.

Work involves responsibility as Asst. Data Processing Manager, DOS/VS systems generation and maintenance including CICS and ATMS, application program maintenance and technical assistance to programmers. A background in Statistics, Accounting for Computer Science is desirable, as well as five years in ALC programming and supervision.

Salary up to $23,000 depending upon qualfications. Submit resume to:

Mr. U.H. Leach, Manager
Data Processing Center
National Academy of Sciences
2101 Constitution Ave., N.W.
Washington, D.C. 20418
Equal Opportunity Employer

PROGRAMMERS SYSTEMS ANALYSTS

Seattle, Metro, is seeking applicants with programming/systems analyst experience to provide systems support for its water pollution and transit projects. A bachelor's degree in a relevant field or the equivalent experience is required. In addition, applicants must have one — five years of experience which must have included one or more of the following: Fortran, PL/I, BAL or COBOL, OS, & OS-JCL on large scale equipment (360-40 level or higher). These positions will be responsible for the development and support of the online and/or batch systems required to satisfy various applications (i.e. Payroll/Personnel, Transit Scheduling, Water Quality Data Base, etc.). Salary — open depending upon qualifications. Please send resumes to Metro Employment Office, 600 1st Avenue, Seattle, Washington 98104. Seven positions are being recruited and filled through the year's end.

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senior programmer analyst
Portland, Oregon

Have immediate opening in a 370-158 environment for Senior Programmer Analyst. Desirable requirements are Bachelor's degree in computer science or business administration. Graduate education with teaching experience highly desirable.

Must be thoroughly familiar with information needs of management, formal systems techniques, written communications and oral presentations. Requires four to six years experience in systems and programming.

Excellent benefits, salary open depending on experience. Send resume to Portland General Electric Company, 621 S.W. Alder Street, Portland OR, 97205, attn: Industrial Relations. (503) 228-7181, extension 1147.

an e o e m/f

Portland General Electric Company

DIRECTOR OF COMPUTER RESOURCES
Medical University of South Carolina
Charleston, South Carolina

Description: The Medical University of South Carolina invites nominations and applications for the position of Director of Computer Resources, the person with the principle responsibility for development and coordination of computer resources at the Medical University. The Medical University, located in Charleston, is comprised of Colleges of Medicine, Dental Medicine, Graduate Studies, Pharmacy, Nursing, Allied Health Sciences, and a 502-bed hospital. There is a current enrollment of 2,216 students. Some 615 faculty members are employed full-time and over 500 practicing professionals are on the clinical part-time staff. The total number of employees is approximately 5,000. **Qualifications:** Nominees and applicants should have a broad knowledge of computer systems, in general, experience in the health professions, and the ability to provide leadership in the application of computer technology among the health professions at the Medical University of South Carolina.

Please send letters of application or nomination and a resume to:

Dr. William E. Groves
Chairman, Search Committee for Director of Computer Resources
Office of the President
MEDICAL UNIVERSITY of SOUTH CAROLINA
80 Barre Street
Charleston, South Carolina 29401

The deadline for applications or nominations is July 31, 1976. The Medical University of South Carolina is an Equal Opportunity Employer.

SYSTEMS ANALYSTS & PROGRAMMERS

Information Systems Organization has outstanding opportunities for Design Specialists, Senior Programmer Analysts, and Computer Programmers interested in positions offering the potential for rapid career advancement. Preference will be given to candidates with:

- IMS online/batch experience uitlizing COBOL.
- Background experience in materiel, logistics, manufacturing, business and engineering applications.

Education should include a BS/BA degree in Business or the equivalent in experience.

Send Resume to:

Professional Employment — Dept. CW
B-1 Division
Rockwell International
5701 W. Imperial Highway
Los Angeles, Calif. 90009

Rockwell International

An Equal Opportunity Employer

Operations Supervisor

NCR CENTURY shop is in need of experienced individual to take complete responsibility for around-the-clock computer operations. We presently have two CENTURY 201 systems that will be replaced soon with two CRITERIONS as we move towards continuous on-line services for the banks in our holding company. Familiarity with NCR's B1, B2 and B3 operating systems is desired as is supervisory experience. Send resume to:

NB SERVICE CORP.
P.O. Box 7667
Charlottesville, Virginia 22906

PROGRAMMER/ ANALYST

Fortune 100 mfr has urgent need for P/A exp in CDBOL and familiar with large 360/370 systems. FORTRAN, BASIC, PL 1, JCL definite pluses. Will also do internal consulting. Salary $16K range.

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Chicago, Illinois 60601
(312) 782-6930

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Please contact:
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125 High Street
Boston, MA 02110
(617) 482-7748

ROMAC
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A network of Partners in: Portland, Hartford, New Haven, Stamford, Rhode Island, Buffalo, Rochester/Syracuse, Wellesley Hills, Ma., Boston, Washington, D.C., Charlotte & Atlanta.

PROGRAMMER and PROGRAMMER ANALYSTS

Growing organization needs ambitious individuals to fill positions in top-flight data processing operation requiring one or more years programming experience, thorough knowledge of COBOL, and IBM OS/JCL required.

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Education should include a BS/BA degree in Business or the equivalent in experience.

Send resume to:

Professional Employment-Dept. CW
B-1 Division
Rockwell International
5701 W. Imperial Highway
Los Angeles, Calif. 90009

Rockwell International

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PROGRAMMER

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P.O. Box 1228
Minneapolis, MN 55440

PROGRAMMER OR PROGRAMMER ANALYST

Large rapidly growing midwestern financial company has opportunities for experienced data processing personnel.

PROGRAMMER/ANALYST — 1 to 3 years systems and programming experience using COBOL under OS. Insurance experience preferred but not necessary.

Also seeking mini-computer programmers and programmer analysts to participate in the development of a data capture system. Assembly language programming is a must, Datapoint experience is a plus.

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Employee Relations Department
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385 Washington Street
St. Paul, Minnesota 55102

The St. Paul

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Project Manager

Chicagoarea college needs Project Manager. Minimum four years Data Processing, with emphasis on designing and implementing systems on 360/370 or compatible computers. Experience with ANS COBOL and college application desired. Responsibilities involve leading a team of programmer/analysts in software development. Excellent fringe benefits. Salary commensurate with experience. Send resume with salary history in confidence to:

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14 - 22K

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PDP-11 experience helpful.

All Fee Paid

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Dale Sare
Director of Data Processing
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Lawton, Oklahoma 73501
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Our second position requires an individual with approximately 5 years of systems analysis and programming experience in a manufacturing environment using IBM OS/VS with COBOL as the primary language. Candidate will be required to perform all aspects of systems development for definition of systems requirements through programming and systems documentation.

For both positions a degree is preferred; however, related practical experience will be considered as an alternative.

We offer excellent starting salaries, full benefits, and real opportunities for advancement in our challenging, sophisticated EDP environment. For confidential consideration, please forward your resume, including salary history and requirement, to: JANET RDBB, EMPLOYMENT REPRESENTATIVE, DEPT. CW

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East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).

Midwest: Chicago (312) 782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).

South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).

West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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Oklahoma City, Oklahoma 73126
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($50,000 Range)

Southwest computer company needs a strong manager to direct its systems programming and software development activities. The appropriate candidate will have the following background:

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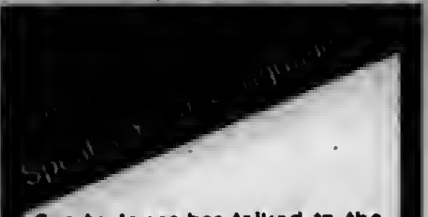

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SYSTEMS ANALYST

with heavy accounting applications background to work with 6 man programming team in a very rapidly expanding clinical laboratory. Degree preferred. Minimum 4 years experience. Salary to $17,000 per year with excellent fringe benefits.

Send resume to:

Personnel Dept.
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EDP MANAGER

City of New Orleans seeks qualified person for manager slot in EDP Bureau. 3 years IBM 370/OS and 5 years managerial experience in data processing a must. Experience should cover systems development, operations, data entry, and production control. Bachelor's degree also required but additional experience may substitute. New criminal justice, geoprocessing, personnel, and other systems now under development. A challenging position for the right person. Contact Robert Link, Department of City Civil Service, City Hall, New Orleans, La. 70112.

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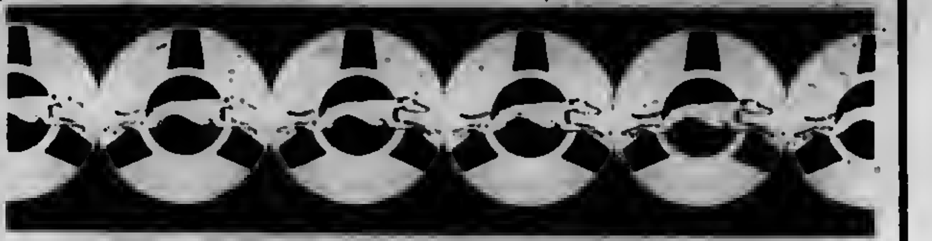

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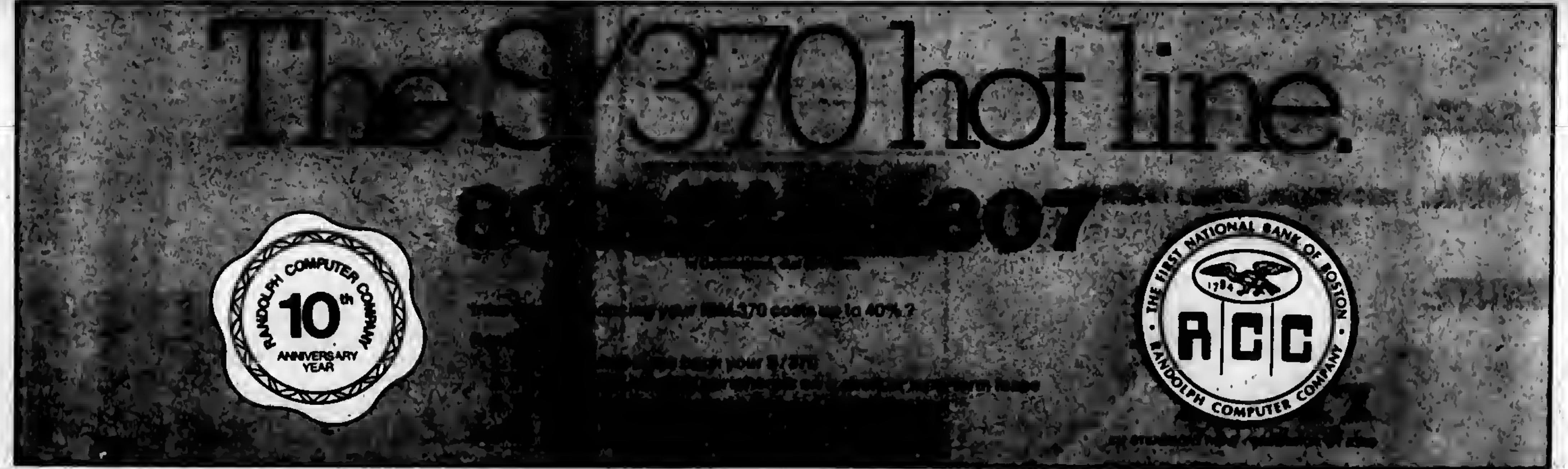
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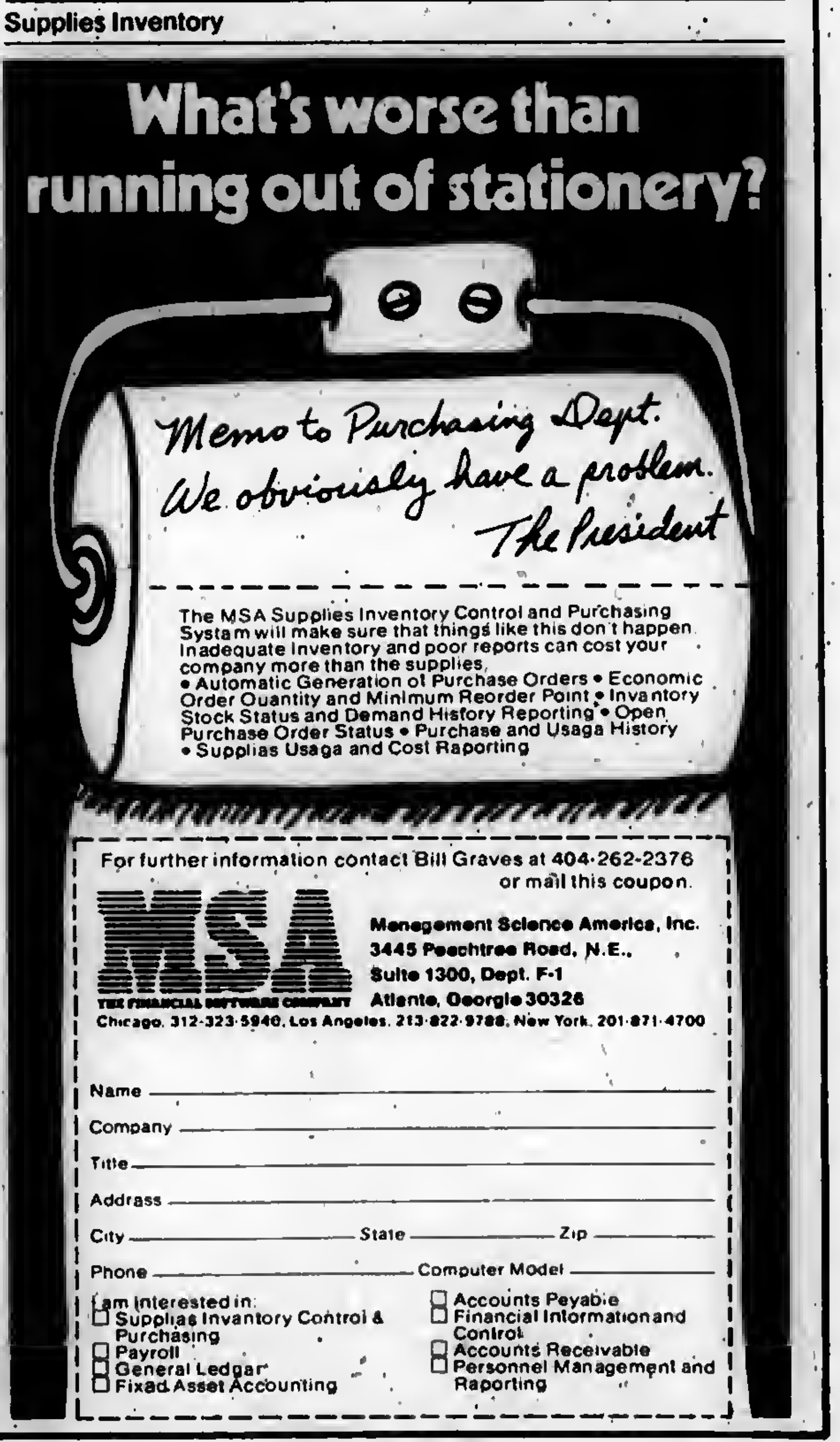

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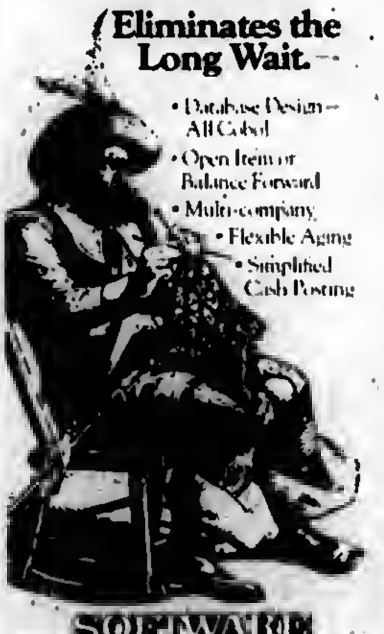

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Ampex Has 'Significantly Successful Year'

REDWOOD CITY, Calif. – For Ampex Corp., fiscal 1976 was a "significantly successful year," President Arthur H. Hausman said.

The firm showed an 89% increase in its pretax income from continuing operations exclusive of nonrecurring items for the year; and for the fourth quarter, this item rose to $2.9 million compared with $278,000 in the year-ago period.

If it had not been for the accounting treatment for the proposed settlement of class action suits brought by purchasers of the firm's securities between May 1970 and August 1972, earnings for the year would have been about the same as last year's earnings, which included a $13 million settlement from IBM, Hausman observed.

"This is the fourth consecutive year of substantial improvement in the company's operations," he added.

For the year, revenues totaled $257.9 million compared with $244.9 million in 1975.

Income from continuing operations before income from nonrecurring items and taxes on income rose to $9.4 million compared with $5 million last year.

Earnings totaled $8 million or 74 cents a share for the year compared with $10.3 million or 95 cents a share last year when there was a $13 million credit from the IBM settlement.

During the quarter ended May, revenues climbed to $67.4 million compared with $64.1 million last year.

Earnings totaled $844,000 or 8 cents a share, including a $1.1 million charge for settlement of class action suits, compared with a loss of $2.5 million or 54 cents a share last year.

During the year Ampex reduced its debt by $33 million, bringing consolidated corporate debt from a high of $253 million in mid-fiscal 1972 to $110 million at the close of fiscal 1976, including $60 million of subordinated debentures.

"This debt reduction of $143 million, combined with interest payments to our lenders and debenture holders, totals over $200 million in repaid principal and interest," Hausman said.

MDS Year Shows Profit For First Time Since '70

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) managed to show an annual profit for the first time since 1970, the firm said.

Aided considerably by special credits, both the fourth quarter and year ended April 30 were profitable.

During the year the firm earned $13.6 million or $1.92 a share, including an $11.5 million special credit, compared with a loss of $21.7 million or $3.47 a share last year.

Revenues Declined

Revenues for the year declined to $161.7 million compared with $170.1 million last year.

Rentals and service income rose slightly to $109.5 million from $109.4 million last year, while sales declined to $52.2 million compared with $60.7 million in 1975.

The firm also included currency translation gains of $2.2 million in fiscal 1976 profits. Translation losses of $1.7 million were recorded in the previous year.

For the fourth quarter, the firm showed earnings of $10.2 million or $1.39 a share, including special credits of $9.4 million.

This compared with the year-ago period's loss of $11.5 million or $1.84 a share. The 1976 special credits were from the firm's debenture exchange offer.

Revenues for the quarter declined to $41 million compared with $44.5 million in the same period last year, with both sales and rentals and service income showing declines.

Sales dropped to $14.6 million from $15.8 million and rentals and service income declined to $26.4 million compared with $28.7 million in the year-ago quarter.

GA Cuts Losses In Nine Months

ANAHEIM, Calif. – General Automation, Inc.'s (GA) losses grew during the third quarter but diminished in the nine months compared with those of the year-ago periods.

Shipment slippages into the fourth quarter were primarily responsible for the third-quarter loss, according to Lawrence A. Goshorn, GA president.

"These delays were caused by several necessary fundamental changes in our manufacturing operations in the quarter," he said, adding GA expects the fourth quarter to be a record quarter for shipments.

During the third quarter, revenues rose to $14.5 million compared with $13.2 million in the same period last year.

However, the loss grew to $1.4 million or 57 cents a share compared with a loss of $660,000 or 27 cents a share a year ago.

In the nine months, revenues climbed to $47.8 million compared with $41.4 million. Losses were cut to $1.2 million or 50 cents a share compared with the $2.5 million or $1.02 a share loss in the same period last year.

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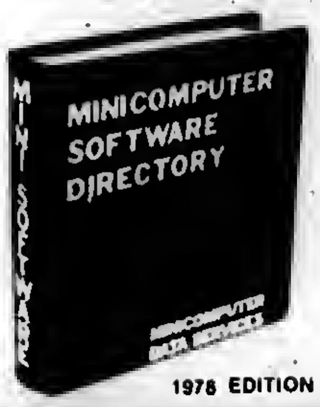

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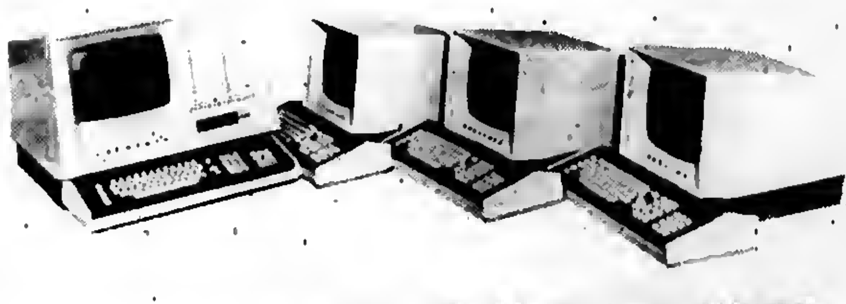

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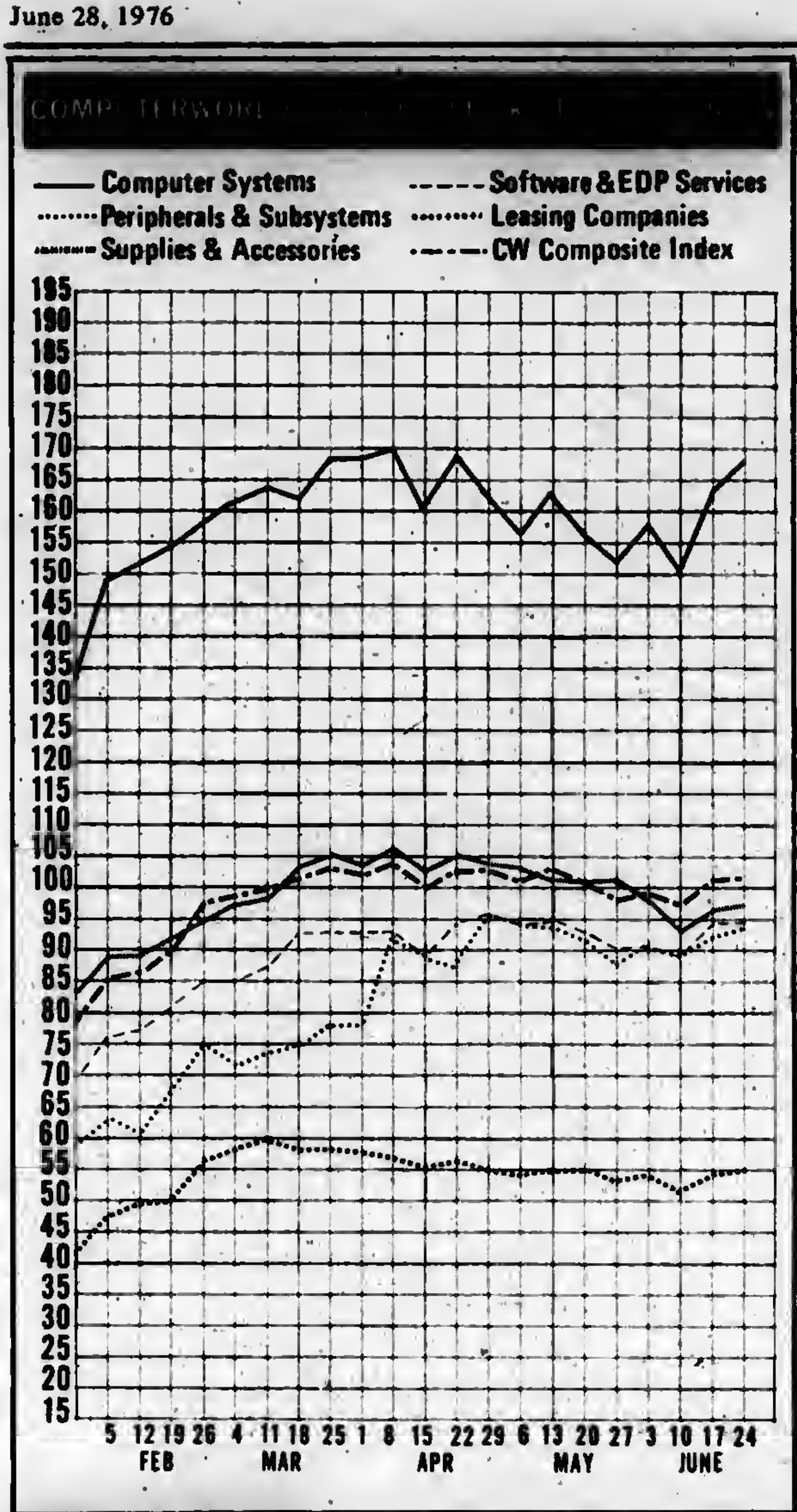

Earnings Reports

INCOTERM
Year Ended Feb. 29

	a1976	1975
Shr Ernd	$1.24	$.12
Revenue	32,696,000	21,404,000
Tax Cred	276,000	175,000
Earnings	2,500,000	325,000
3 Mo Shr	.29	.34
Revenue	8,752,000	7,408,000
Tax Cred	83,000	175,000
Earnings	590,000	623,000

a-Preliminary.

INFOREX
Three Months Ended April 2

	1976	a1975
Shr Ernd	$.12	$.03
Revenue	14,907,000	13,146,000
Tax Cred	141,000	58,000
Earnings	353,000	79,000

a-Restated to reflect accounting change for foreign currency translation.

APPLIED DATA RESEARCH
Three Months Ended March 31

	1976	1975
Shr Ernd	$.27	$.02
aRevenue	3,331,421	b3,220,253
Disc Op	.....	(87,397)
Tax Cred	163,000	11,000
Earnings	332,715	23,325

a-From continuing operations. b-Restated.

COMDISCO
Three Months Ended March 31

	1976	1975
Shr Ernd	$.66	$.31
Revenue	18,871,800	7,016,443
Earnings	747,693	380,373
6 Mo Shr	1.04	.48
Revenue	37,939,752	19,182,920
Earnings	1,218,124	589,050

COMPUTERVISION
Three Months Ended March 31

	1976	1975
Shr Ernd	$.04	.....
Revenue	6,798,000	$4,669,000
Tax Cred	33,000	.....
Earnings	105,000	(178,000)

DATA 100
Three Months Ended March 31

	1976	1975
Shr Ernd	$.26	$.40
Revenue	29,284,000	20,852,000
Tax Cred	126,000	580,000
Earnings	946,000	1,380,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 23, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	101	+1 1/8	+1.1
O	COMPUTER AUTOMATION	10- 19	16 3/4	+1 3/4	+11.6
N	CONTROL DATA CORP	18- 27	22 3/8	+ 1/8	+0.3
N	DATA GENERAL CORP	40- 60	53 5/8	+ 1/2	+0.9
O	DATAPOINT CORP	24- 46	44 1/4	+2 1/2	+5.9
O	DIGITAL COMP CONTROL	2- 7	6 3/8	+1 1/2	+30.7
N	DIGITAL EQUIPMENT	139-181	173 1/2	+9 1/4	+3.6
N	ELECTRONIC ASSOC.	2- 5	2 3/4	- 3/8	-12.0
A	ELECTRONIC ENGINEER.	7- 16	11 7/8	+ 1/4	+2.1
N	FOXBORO	28- 46	44 1/8	- 7/8	-1.8
O	GENERAL AUTOMATION	3- 11	7 1/8	- 1/8	-1.7
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	111 1/4	- 1/8	-0.1
N	HONEYWELL INC	34- 55	49 5/8	+1 5/8	+3.4
N	IBM	227-272	272	+9 1/2	+3.6
O	MANAGEMENT ASSIST	1- 3	1 7/8	0	0.0
O	MEMOREX	13- 33	29 1/8	- 3/8	-1.2
O	MICRODATA CORP	10- 26	22 3/4	+ 7/8	+4.0
O	MODULAR COMPUTER SYS	9- 14	13	- 1/4	-1.8
N	NCR	24- 33	32 3/8	+ 1/8	+0.3
O	PRIME COMPUTER INC	4- 11	9 1/4	+ 1/2	+3.7
N	PERKIN-ELMER	19- 27	23 1/2	+2 1/4	+10.5
N	RAYTHEON CO	45- 60	59 1/2	- 3/8	-0.6
N	SPERRY RAND	40- 51	50 1/4	+1 3/8	+2.8
O	SYCOR INC	20- 31	27	+1 1/2	+3.8
A	SYSTEMS ENG. LABS	6- 10	9	0	0.0
N	VARIAN ASSOCIATES	13- 17	14 7/8	+ 7/8	+6.2
A	WANG LABS.	11- 20	14 1/2	+1 7/8	+14.8

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	5 3/4	- 1/4	-4.1
A	COMMERCE GROUP CORP	2- 3	2 3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	2	0	0.0
M	DATRONIC RENTAL	1- 1	1 1/8	- 1/8	-10.0
A	DCL INC	1- 1	3/4	0	0.0
N	DPF INC	5- 7	6 1/4	+ 1/8	+2.0
A	GREYHOUND COMPUTER	3- 9	7 1/8	0	0.0
N	ITEL	6- 13	12 1/2	+1 1/4	+11.1
N	LEASCO CORP	6- 14	12	+ 3/8	+3.2
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/4	+ 3/8	+5.4
N	U.S. LEASING	7- 12	8 1/2	0	0.0

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SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 5/8	0	0.0
O	ANACOMP INC	9- 11	8 3/4	0	0.0
A	APPLIED DATA RES.	2- 3	2 7/8	+ 1/8	+4.5
N	AUTOMATIC DATA PROC	54- 69	67 5/8	- 3/8	-0.5
O	COLEMAN AMERICAN COS	4- 6	3 1/2	0	0.0
O	COMPUTER DIMENSIONS	3- 7	4 3/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	7 1/2	0	0.0
O	COMPUTER HORIZONS	1- 2	2	+ 1/2	+33.3
O	COMPUTER NETWORK	2- 6	3 3/8	0	0.0
N	COMPUTER SCIENCES	4- 8	6 1/8	0	0.0
O	COMPUTER TASK GROUP	1- 1	1 3/8	0	0.0
O	COMPUTER USAGE	3- 6	3 1/2	- 1/8	-3.4
O	COMSHARE	2- 9	3	- 3/4	-8.5
O	DATA DIMENSIONS INC	2- 4	3 5/8	- 1/8	-3.3
O	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	12 1/4	-1 3/8	-10.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 7/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	3	0	0.0
O	KEYDATA CORP	3- 3	2 3/4	+ 1/8	+4.7
O	LOGICON	4- 4	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	2	- 1/8	-3.8
A	NATIONAL CSS INC	13- 23	20 7/8	+1	+5.0
A	ON LINE SYSTEMS INC	18- 22	17 5/8	- 5/8	-3.4
N	PLANNING RESEARCH	3- 5	3 1/8	- 1/8	-3.8
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	3 1/8	+ 3/8	+13.6
O	REYNOLDS & REYNOLD	13- 21	17 1/2	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	19- 28	25 3/8	+ 1/2	+1.9
A	URS SYSTEMS	3- 3	3 5/8	- 1/8	-3.3
N	WYLY CORP	2- 7	2 5/8	- 3/8	-12.3

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	5- 13	5 7/8	- 3/8	-4.0
O	ADVANCED MEMORY SYS	4- 10	7 1/2	- 3/4	-8.0
N	AMPEX CORP	5- 8	7 1/2	- 1/8	-1.6
O	ANDERSON JACOBSON	2- 4	3 1/8	+ 3/8	+13.6
O	APPLIED DIG DATA SYS	13- 23	24 1/4	+ 1/4	+1.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/2	0	0.0
A	BOLT,BERANEK & NEW	7- 10	9 3/8	+ 3/4	+8.6
N	BUNKER-RAMO	3- 8	7 7/8	+ 5/8	+8.6
A	CALCOMP	4- 7	3 3/8	+ 7/8	+18.4
O	CAMBRIDGE MEMORIES	2- 6	2 5/8	+ 1/8	+5.0
N	CENTRONICS DATA COMP	20- 36	32 1/4	+ 1/4	+0.7
O	CODEX CORP	22- 42	31 1/2	-3	-8.6
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 5/8	+ 1/8	+3.5
O	COMPUTER CONSOLES	4- 7	3 3/4	- 1/2	-8.0
A	COMPUTER EQUIPMENT	1- 3	1 3/4	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	1 3/8	+ 1/8	+10.0
O	COMTEN	4- 9	7	0	0.0
N	CONRAC CORP	20- 29	23	- 1/8	-0.5
O	DATA ACCESS SYSTEMS	1- 4	3 3/4	+ 1/4	+7.1
O	DATA 100	7- 13	9 3/8	- 1/4	-2.5
A	DATA PRODUCTS CORP	5- 11	10 1/4	+ 1/2	+5.1
O	DATA TECHNOLOGY	1- 2	1 1/2	+ 1/8	+9.0
O	DATUM INC	1- 2	2 1/4	+ 1/8	+5.8
O	DECISION DATA COMPUT	1- 4	1 7/8	- 1/8	-6.2
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
N	ELECTRONIC M & M	1- 3	2 1/8	- 1/4	-10.5
O	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 7/8	+ 1/8	+1.2
N	HARRIS CORP	34- 49	48 1/8	+1 7/8	+4.0
A	INCOTERM CORP	9- 20	11 3/4	+ 1/8	+1.0
O	INFOREX INC	3- 7	4 1/4	+ 1/4	+6.2
O	INFORMATION INTL INC	10- 18	14 1/4	+ 1/8	+0.8
O	INTEL CORP	60-102	62	-5	-7.4
A	LUNDY ELECTRONICS	4- 7	3 7/8	0	0.0
O	MSI DATA CORP	3- 7	6 1/4	+ 1/4	+4.1
A	MILGO ELECTRONICS	15- 21	20 1/8	- 1/4	-1.2
N	MOHAWK DATA SCI	3- 7	6 1/4	- 5/8	-9.0
O	PENRIL CORP	1- 3	2	+ 1/8	+6.6
A	PERTEC CORP	3- 9	5 3/8	+ 1/8	+2.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTOR CORP	4- 5	4	0	0.0
O	RECOGNITION EQUIP	6- 11	8 5/8	+ 3/8	+4.5
N	SANDERS ASSOCIATES	6- 11	8 7/8	- 1/2	-5.3
O	SCAN DATA	2- 4	2 1/8	- 1/8	-5.5
O	STORAGE TECHNOLOGY	9- 13	10 5/8	- 1/2	-4.4
O	T BAR INC	5- 10	5 5/8	+ 1/2	+9.7
O	TALLY CORP.	4- 6	5	- 1/4	-4.7
O	TEC INC	3- 5	3 1/2	- 1/4	-6.6
N	TEKTRONIX INC	45- 63	50 1/2	+2 1/8	+5.4
N	TELEX	2- 5	3 1/2	- 1/8	-3.4
O	WANGCO INC	11- 22	20 1/8	+2	+11.0
O	WILTEK INC	2- 2	2 1/2	+ 1/2	+25.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	2 3/4	+ 1/2	+22.2
O	BALTIMORE BUS FORMS	4- 5	3 3/4	0	0.0
A	BARRY WRIGHT	6- 10	7 7/8	+ 1/4	+3.2
O	CYBERMATICS INC	1- 1	5/8	- 1/4	-28.5
A	DATA DOCUMENTS	33- 42	33	- 1/4	-0.7
O	DUPLEX PRODUCTS INC	15- 24	15	0	0.0
N	ENNIS BUS. FORMS	6- 9	6 3/4	- 1/8	-1.8
O	GRAHAM MAGNETICS	8- 13	8	- 1/4	-3.0
O	GRAPHIC CONTROLS	13- 19	15 1/2	+1 1/4	+8.7
N	3M COMPANY	53- 65	58	+1 7/8	+3.3
O	MOORE CORP LTD	41- 51	41	- 3/4	-1.7
N	NASHUA CORP	11- 17	15 5/8	+ 3/4	+5.0
O	STANDARD REGISTER	15- 19	15 1/2	- 1/2	-3.1
O	TAB PRODUCTS CO	3- 9	9 1/4	+ 1/4	+2.7
N	UARCO	21- 25	21 1/4	+ 1/4	+1.1
O	VANIER GRAPHICS CORP	5- 8	6 1/2	0	0.0
A	WABASH MAGNETICS	4- 9	6 3/4	+ 5/8	+10.2
N	WALLACE BUS FORMS	19- 25	20 1/4	+ 1/4	+1.2

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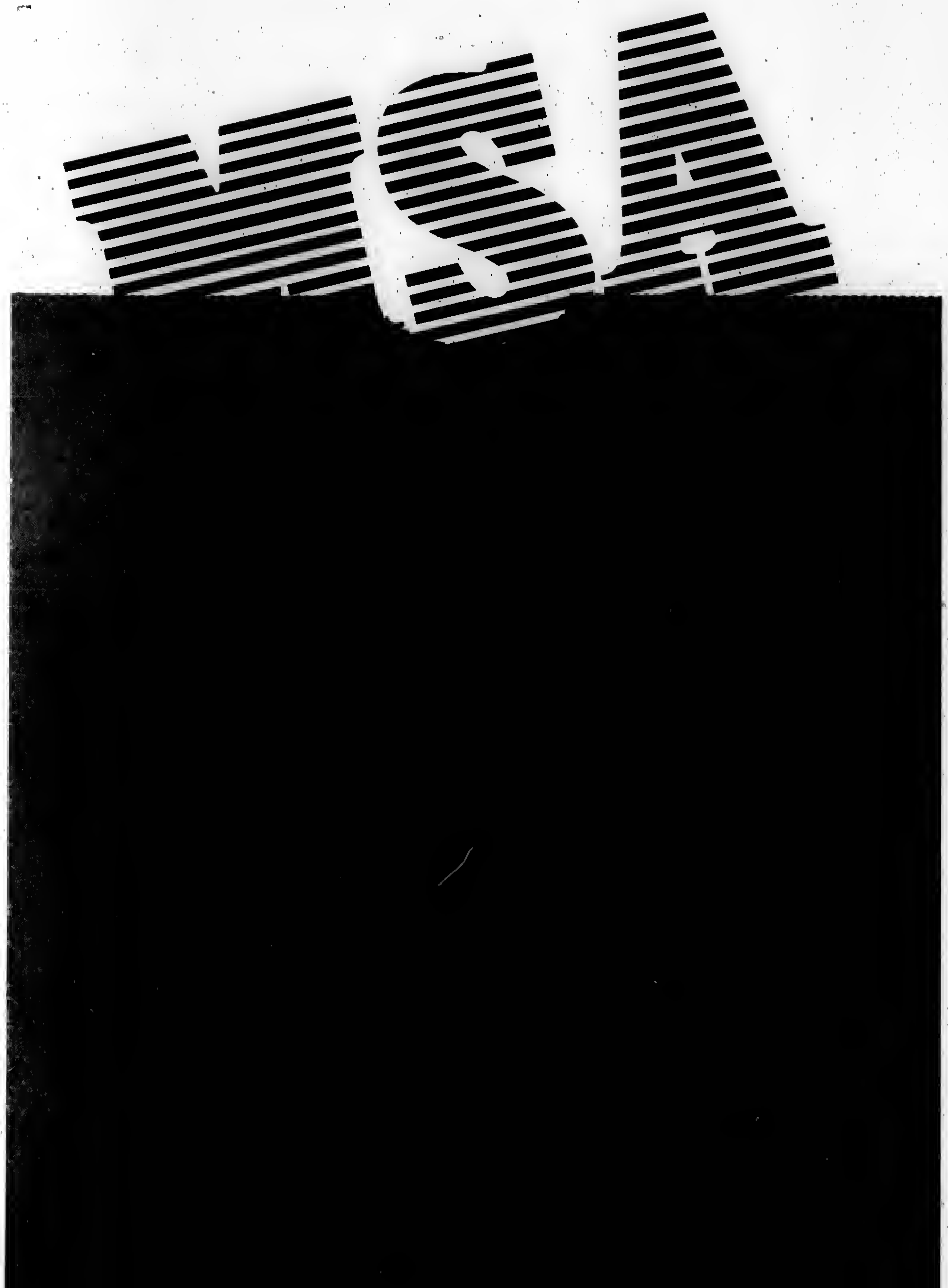

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.
/year July 5, 1976 Vol. X, No. 27

UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103
NEWSPAPER

Reloadable Control Storage Marks Two Models Added To IBM 370 System Line

By E. Drake Lundell Jr.
Of the CW Staff

WHITE PLAINS, N.Y. – Increased control storage that permits more supervisory functions to he resident within the system is the key to the increased performance levels of the 370/138 and 370/148 announced by IBM last week.

The systems perform instructions 26% to 43% faster than their respective predecessors, the 370/135 and 370/145, primarily because of an extended control program support implemented in the control storage, the firm said.

The price and performance benefits of the systems are dramatic enough for some industry observers to claim the systems represent the start of an entirely new line of computers from IBM rather than the culmination of the more than six-year-old 370 line (see related story on Page 2).

Most users with 370/135s or 370/145s can field-upgrade their systems to "the internal performance levels" of the 138s and 148s, IBM said, but they will not get all the features even at a relatively steep price. The upgraded models are the 370/135-3 and the 370/145-3.

In addition to the processors, IBM also announced a lease/rental plan that combines the provisions of the former Term Lease Plan (TLP) and Monthly Availability Charge (MAC) rental plan and reduced prices of the machines still available under TLP. The CPU lease plan is now priced under MAC prices, IBM said.

The systems use 2K Mosfet chips in the main memory and in the reloadable control store as do the other VS 370s. In contrast, the 370/135 and 370/145 use bipolar memory technology.

CPU cycle times for the 370/138 range from 275 nsec to 1,485 nsec depending on the specific instructions, IBM said, while the range is 180 nsec to 270 nsec for the 370/148.

The Model 138 comes with either 500K or 1M characters of main memory, while the 148 comes in either 1M- or 2M-character configurations only.

The reloadable control store in each system is 128K characters, five times the capacity of the previous 135s and four times the previous 145 capacity, the firm said. It is loaded from the console file by diskette, but it is not accessible to the user, IBM said.

The extended control program support implemented in this control storage "reduces the processor time needed to execute certain frequently used supervisor functions in OS/VS1 and VM/370," IBM said.

For example, the firm explained such functions as Virtual Machine I/O, Storage Management, Page Management, Supervisor Call Handler, Privileged Instruction Interfaces, Dispatching and Virtual Interval Timer would be stored in the reloadable control store under VM/370.

Under OS/VS1, such things as Storage Management, the I/O Supervisor, Supervisor Call FLIH, System Trace and Page Management would be in the reloadable control store, the firm said.

Users of VM/370 on the systems can realize a reduction of up to 55% in the processor cycles required for supervisor operations, according to the vendor. For

(Continued on Page 2)

The IBM 370/148 announced last week provides a maximum main memory of 2M characters. Internal performance speeds range up to 43% faster than the 370/145, IBM said.

Bell-Fostered Reform Act Shown To Have No Impact on Consumers

By Ronald A. Frank
Of the CW Staff

CLEVELAND – Despite its name, the Consumer Communications Reform Act of 1976 will have no direct effect on the cost of phone service to the average residential user.

This was the consensus of opinion at a recent debate on telecommunications policy held at Cleveland State University for national consumer group representatives. Despite claims of potential increases in residential phone rates, members of the telephone industry were not able to identify a direct consumer impact from nonpassage of the Reform Act which is pending before Congress.

The day-long session included representatives of the Bell System, independent telephone companies, Federal Communications Commission (FCC), specialized common carriers, independent data communications equipment suppliers and others who tried to interpret for consumers the industry competition fostered by the specialized carriers and noncarrier equipment suppliers.

Planning for the conference was underwritten by a $20,000 grant from the Bell System and the U.S. Independent Telephone Association to gain consumer support for the Reform Act.

Sol Harge, director of the Cleveland Consumer Protection Association, introduced the debate by saying it had been impossible to find a consumer representative who understood the legislation well enough to speak on the subject.

The issue raised by the Reform Act is whether the consumer will have the right to choose his own equipment. The issue is not one of competition within the industry, according to Walter Hinchman, chief of the Common Carrier Bureau at the FCC.

The telephone company has failed to

(Continued on Page 4)

CW Photo by R. Frank
Walter Hinchman

Honeywell Level 66 T/S Units Support Heavy Interactive Use

By Esther Surden
Of the CW Staff

WALTHAM, Mass. – The three Honeywell Series 60/Level 66 mainframe models introduced last week were designed to give users with heavy time-sharing requirements approximately twice the performance of Honeywell's batch-oriented models while maintaining comparable batch performance, a spokesman said.

Enhancements to existing Level 66 models and a revised entry-level configuration, the 66/05, were also announced.

The three time-sharing systems, the 66/07, 66/17 and 66/27, correspond to the firm's 66/05, 66/10 and 66/20 batch models and are best suited for service bureau, educational, scientific, engineering and government applications, Honeywell said.

They are intended to be an independent family of time-sharing systems apart from the earlier models and are field-upgradable only within the family, the spokesman noted. Existing Level 66 users cannot field-upgrade to the latest systems, he added.

Hardware changes have been made to the Level 66 CPU to accommodate the increased time-sharing capabilities; four printed circuit boards were redesigned, representing a 10% to 15% logic change in the CPU, the spokesman said.

The Gcos operating system has also been enhanced, Honeywell said, so all programs running on earlier Honeywell models can be run on the time-sharing models.

The basic Model 66/07 with 96K words of 4K MOS memory and a Datanet 6624 front-end processor can support 24 asynchronous communications lines.

A 128K Model 66/17 and the Datanet processor accommodates 48 lines while

(Continued on Page 4)

Sanders CRT Works Under SDLC At SNA Interface Demonstration

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – Sanders Data Systems last week demonstrated a working interface that allows its IBM-compatible CRT terminals to operate under IBM's Systems Network Architecture (SNA).

Using a Sanders 8170 series CRT with a programmable controller, the demonstration included both IBM and Sanders terminals operating under Synchronous Data Link Control (SDLC) to a 370/158. As part of the demonstration, a typical insurance data base was accessed using first an IBM 3270 and then a Sanders 8170 terminal, both using SDLC.

The Sanders SNA/SDLC interface included several modifications to the Sanders controller to allow the 8170 CRT to emulate an IBM 3270 Model 12 display. The interface consisted of a modem interface board which detects SDLC flag characters and performs zero insertion and deletion; plus the controller had about 1.5K bytes of software to perform the emulation and respond to the SDLC format, a spokesman said.

The SDLC transmissions were sent via a four-wire unconditioned private line facility at 2,400 bit/sec using Bell 201A3 modems. The 158 in the Sanders DP center was operating under IBM's Virtual Telecommunications Access Method (Vtam) with IMS/VS and CICS/VS. A 3704 front end to the 158 was operating

(Continued on Page 5)

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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700.

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IBM 370/138, 148 Really 'Early 380s'?

**By Ronald A. Frank
And E. Drake Lundell Jr.
Of the CW Staff**

WALTHAM, Mass. – The IBM 370/138 and 370/148 "may be described as early 380s programmed to act like 370s," according to James Peacock, editor of *EDP Industry Report*, which is published by International Data Corp. (IDC), an industry research firm here.

And that seems to be the early line on the two systems announced by IBM last week – they represent the start of something new rather than the culmination of the old 370 line.

The significant increase in the capacity of the control storage on both machines, which permits more operating system macros to reside in the firmware, will make upgrades to the virtual machine concept more practical, industry sources said, and clearly indicated IBM is fully endorsing the virtual machine concept.

Previously, users had been hesitant to move to the virtual machine systems, but the increased control store should ease the upgrade, they said.

In addition, the pricing of the systems is extremely interesting, the sources said. The CPU and memory for the 138 and the 148 carry a purchase/rent ratio of 38 months to 40 months while most previous IBM CPUs carried around a 48-month payout.

By making the Term Lease Plan (TLP) price lower than the Monthly Availability Charge (MAC), users are encouraged to sign up for longer term leases. This was probably designed to get user commitments for a longer period as a hedge against the 148- and 158-like CPUs now reportedly about to be introduced, the sources said. Many of these machines are of Japanese origins, they added.

The higher prices for the field-upgraded 145s and 135s are believed to lock in most purchase users, many of whom do not yet have enough of a financial write-off on their equipment to justify a CPU move at this time.

The easier conversion to VM/370 is considered a prerequisite for later model introductions by IBM. Upgrades to virtual operating environments by users, especially the VM/370 operating system, are believed to be IBM's goals.

Lower lease/purchase ratios on the 138 and 148 will make life harder for the third-party leasing plans. It may also convince current lease customers to convert to a newer plan with the 138 and 148.

IBM Extends 370 System Line

(Continued from Page 1)

OS/VS1 users, the savings on the 138 were measured at 13% to 18%, IBM said, and at 9% to 20% for the 148.

The systems are supported by OS/VS1, VM/370 and DOS/VS, the firm said.

In addition to the internal performance improvements with the 138 and 148 systems, IBM claimed they also offer increased system throughput when compared with their predecessors.

The batch processing throughput of a 370/138 running a representative set of selected DOS/VS jobs was measured at 1.18 to 1.38 times faster than a similarly configured 370/135, IBM said.

The batch throughput on the 370/148 for the same type of job mix under OS/VS1 measured 1.03 to 1.47 times faster than a similar 370/145, the firm said.

The instruction execution rate of the 370/138 was said to be 29% to 36% faster than the 370/135, while the rate for the 370/148 was measured at 26% to 43% faster than a 370/148, the firm added.

The systems include a 3270-type display console of 1,920 characters, but this feature is not available to field-upgraded 370/135s and 370/145s.

In addition, the systems also have an adapter for attachment of an optional IBM 3286 Model 2 printer for hard-copy output of the console information, the firm said, adding this too is not available with the upgraded units.

A version of the 3203 printer which runs at 1,200 line/min is also available. It attaches to the systems through an Integrated Printer Adapter (IPA) which IBM also introduced last week for its mid-range machines.

One or two of the 3203 Model 4s can be attached to a 138 or 148, and the IBM 1403 printer can be attached to the 370/138 via the IPA, the firm said.

Several features optional on the 370/145 and the 370/135 are standard on the systems, including APL assist, clock comparator and CPU timer, floating point, extended precision floating point, conditional swapping (for the 370/138 only) and block multiplexer channels.

Under the Agreement for Lease or Rental of IBM Machines for the 370/138 and 370/148, users can elect either a 48-month contract period or monthly rental, with purchase credits the same as those under TLP or MAC.

However, the 48-month lease costs 9% less per month than the rental plan. Previously the prices for MAC and TLP had been the same except that the TLP customer received rate protection and had unlimited use of the machine while MAC was limited to 176 hour/mo usage.

At the same time IBM announced the lease/rental plan, however, it also announced that as of July 1 the monthly lease charges in effect under TLP would be reduced by 9%, bringing them in line with the provisions of the latest plan.

Under a 48-month contract, a 138 leases for $8,730/mo with 500K main memory and for $11,415/mo with 1M characters. Monthly rentals are $9,600 and $12,550 while the purchase prices are $350,000 and $435,000 respectively.

The 370/148 under the four-year plan leases for $17,280/mo with 1M characters and for $22,650/mo with 2M characters; the monthly rental is $19,000 and $24,900 and the purchase price tags are $689,000 and $859,000 respectively.

The 1M-character 370/138 will be delivered in this year's fourth quarter, while the 500K unit will be delivered in the first quarter of 1977. The Model 148 in both memory sizes will be delivered in the first quarter of 1977, the firm said.

Users May Have Jump on Upgrades

WHITE PLAINS, N.Y. – Users who decide to upgrade their installed IBM 370/135s and -145s to the capabilities of the 370/138 and -148 introduced last week may already have some of the required options running on their systems.

To upgrade a 135 in the field, a new gate is attached with the new instruction execution unit, the prerequisite extended floating point (if the user has not already installed this as an option) and the increased reloadable control store in addition to some power units.

Any 135 can be upgraded to a 135-3 in the same memory size for a price of $120,000, IBM said.

Two gates have to be added to a 145 for the field upgrade, the firm said, and they contain the instruction execution unit, the larger capacity control store and power components, plus the prerequisite word buffer, clock comparator and CPU timer if they have not already been installed as options.

The basic price for the 145-2 upgrade to a 145-3 is $190,000, IBM said.

However, the purchase price for a 135-3 or a 145-3 is more than twice the purchase price of a comparable 138 or 148.

The purchase price on a 500K 135-3, for example, would be $721,500 and it would rent for $16,040/mo, while the same sized 138 would carry a $350,000 price tag and a monthly rental of $9,600.

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Decisions

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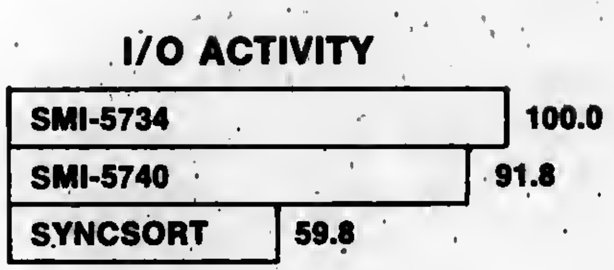
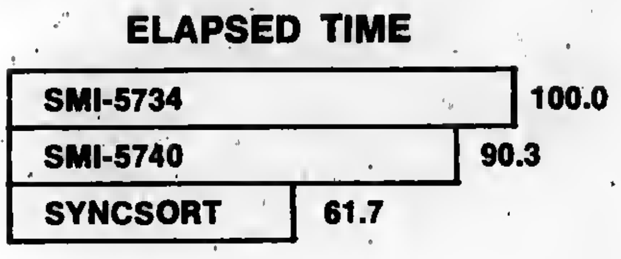
Even the Ph.D.'s around our place regard our discovery with a certain amount of awe. They refer to it, in hushed tones, as the "SyncSort Factor."

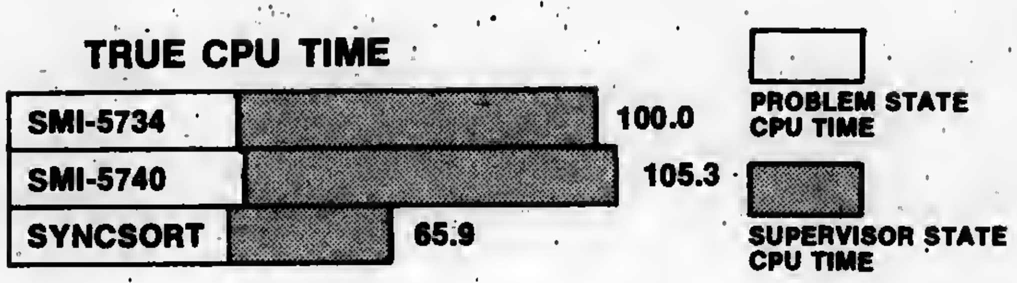
It's a progression that goes something like this:

1. IBM will continue to make and market computers. (That seems like a safe $2 bet.)
2. The busy people who use these computers will naturally require the best sort package they can obtain. (Sorting is the most frequent job on any commercial computer.)
3. These people — being intelligent men and women — will sooner or later find their way to SyncSort III-and-a-half. (It's the best sort package on the market.)
4. None of the foregoing will harm our business. (We will continue to update our package so that it will always stay ahead of the competition.)
5. This will lead to more sales and more improvements. (Maybe we should call our discovery the "Law of Perpetual Sorting Improvement!")

If you'd like a graphic representation of the "SyncSort Factor" take a look at the picture below. These graphs depict what happens when you match SyncSort III-and-a half against other sorts on the market today:







Performance is, of course, the bottom line in sorting. But it's not the only thing you should consider in choosing a sort package. Is the sort versatile, for example? Will it support 3350 devices in their native mode without having to sysgen a new system? SyncSort III-and-a-half *will*.

And how's the sort support? Will anybody help you phase the package in when you start using it? If you call the other supplier with a tricky little question, will there be anybody there willing to take the time and effort to give you a reasonable answer?

We will. In fact, we *like* receiving questions from users. It's a hangover from the days when we were pioneering all those developments that opened up the sorting industry. Once an explorer, always an explorer!

The foregoing are some reasons why SyncSort has been so successful in penetrating its market. (In fact, we think we may have obtained a bigger slice of our market than any other software product.)

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Debaters Find Reform Act Has No Impact on Consumers

(Continued from Page 1)

demonstrate telephone consumers should be denied the use of their own noncarrier equipment, Hinchman said, adding that to date the backers of the Reform Act have not shown this has an economic impact on anybody's phone bill.

FCC decisions establishing the specialized carriers and allowing the interconnection of noncarrier equipment were actually "tinkering with the fine working machine" that is the telephone network, according to E. William Henry, counsel for Continental Telephone Co. Unless the Reform Act is passed by Congress, basic phone service will be lower in quality and higher in price, Henry told the attendees.

The only telephone users who will benefit from current FCC policies are big business and a small group of rich residential users, Henry said.

Several speakers during the day repeated the Bell claims that phone rates for the average user will go up as much as 70% if Congress does not act to reverse current FCC policies. Consumers repeatedly asked how this claim could be substantiated, but speakers said Bell accounting methods made it impossible to interpret financial impacts on any one group of phone users.

CW Photo by R. Frank

Paul Muench

"We are not crying wolf," Paul Muench, AT&T director of policy and regulatory matters said. AT&T pricing policies will not work in an atmosphere of selected competition, which will slow the rate of technological development of the Bell System, he said.

"Competition as it now exists is rigged competition, and the FCC keeps changing the rules," Muench said.

Speaking for the specialized carriers, John Guttenburg, vice-president of Data Transmission Co. (Datran), said the public is being asked for statutory blessing of the Reform Act by a massive lobbying effort by Bell in an attempt to achieve a complete monopoly.

AT&T is forced to keep on its toes by competition so it wants to turn the clock back, he said. "It won't happen because the consuming public won't let it happen," Guttenburg added.

"The telephone is a pay-forever device which costs the average consumer about $2,000 over his lifetime," according to Ed Spievack, counsel for the North American Telephone Association.

Instead of this pay-forever approach, the FCC is giving the consumer an option of buying a phone for a one-time cost of $15 to $20, he said. The Consumer Communications Reform Act would more accurately be called the "Monopoly Protection Act," he added.

Glenn Watts, president of the Communications Workers of America, said there is a trend to building bad products such as "disposable plastic radios" and he said the Reform Act was an attempt to prevent this kind of thing by setting proper industry standards.

The Reform Act is designed to achieve the total destruction of competition, Herb Marks told the session. "They are going for a total kill of an industry" and all added costs will be borne by the consumer, according to the counsel for the Independent Data Communications Manufacturing Association.

Three T/S Machines Extend 60/66 Family

(Continued from Page 1)

the 128K 66/27 with the Datanet 6632 front end supports 64 or more lines, Honeywell said.

The 66/07 is in the range of the Univac 1120 or the Burroughs B6748; the 66/17 compares to the Univac 1140 and the Burroughs B6750; and the 66/27 can be compared to the Univac 1140 and a larger B6750, Honeywell said.

The basic configuration for the entry level 66/05, also introduced last week, includes a CPU with 96K words of 4K MOS memory, system console, card reader and 1,100 line/min printer, Honeywell said.

Introduced to operate with the 66/05 were a four-communications line Datanet 6616 front-end processor, MSU0402 disk storage unit providing an additional 100M bytes of unformatted disk storage and a MTU4012 magnetic tape "cluster." Up to four of the disk systems can be attached to the 66/05.

The cluster consists of two 75 in./sec magnetic tape units; additional units can be added, Honeywell said.

Honeywell also announced the memory of the Model 66/10 can now be expanded to 356K words from its previous ceiling of 128K words.

In addition, the Models 66/10, 66/20 and 66/40 will be available with free-standing central processors, independent system control units and I/O multiplexers. Previously, control units were integrated into the system package, Honeywell said.

The purchase price of the basic 96K 66/07 with 24 communications lines is $807,888; the 128K Model 66/17 costs $1,080,233 with 48 lines and the 128K 66/27 with 64 lines costs $1,451,716.

The 66/07 can be rented for $17,209/mo on a five-year plan; maintenance is $2,272/mo. The rental price for the 66/17 is $22,396/mo with a $2,636/mo maintenance charge. The 66/27 costs $29,165/mo on the five-year plan; maintenance is $3,350/mo, Honeywell said.

The entry-level 66/05 with the Datanet 6616 processor costs $698,300 with a maintenance fee of $2,206/mo. The system can also be rented for $14,530/mo on the five-year lease plan.

The three time-sharing models, the 66/05 and the system enhancements will be available by the end of the year, Honeywell said from 200 Smith St., Waltham, Mass. 02154.

Be where the
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State Forbids Bank Branches

Court Rules Off-Site CBCT Illegal Under Illinois Law

By Toni Wiseman
Of the CW Staff

CHICAGO – The controversy over electronic money machines was stirred up again recently when a U.S. Court of Appeals ruled here that customer-bank communications terminal (CBCT) sites constitute branch bank offices under Illinois law.

But several stays of action by that appeals court and possible action by the U.S. Supreme Court have left the issue in limbo.

In addition, a home-rule measure proposed by Chicago's Mayor Richard J. Daley has clouded the scene.

The court's ruling against two Chicago banks which have installed off-premise CBCTs came in response to an appeal of the definition of a branch bank made by a federal judge last December.

Branch offices are illegal under Illinois law and, according to Judge Herbert L. Will's definition, the off-premise CBCTs installed by the Continental Illinois National Bank and Trust Co. and the First National Bank of Chicago are branches.

Distance Limitation

The same terminals would be legal, however, if they were located on or within 1,500 feet of a bank's premises or if their use were limited to cash withdrawals and payments on installment loans already granted, Will said.

Continental and First National had appealed Will's ruling contending that the terminals do not constitute branches since they do not provide full-service banking.

Customers currently use the two banks' remote tellers for deposits, withdrawals, loan payments and funds transfers between savings and checking accounts.

The appeals court's three-judge panel, however, stated "cash withdrawals and payments [are] business transactions carried on at the main office and therefore are within the branch definition."

Continental Terminals in Use

Continental filed a petition with the U.S. Supreme Court asking it to review the case shortly after the appeals court handed down its ruling.

A spokeswoman for Continental said the CBCTs are continuing to operate, at least until July 16, under an appeals court stay. If the Supreme Court does not issue a stay of its own or make a final decision on whether to hear the banks' case by that date, however, operations will have to cease, according to Judy Van Slyke.

It is more likely the Supreme Court will issue its own stay, she added.

While Continental has three CBCTs in operation, only two are affected by the ruling – one in a railroad station and one in a downtown office building. The third terminal is located in a building wall across the street from the main office, but within the mandatory 1,500 feet, Van Slyke noted.

And, she added, Continental still plans to implement a drive-in CBCT this summer, also within the distance limitation.

The ruling does not affect Continental's check-verification terminals located in supermarkets, Van Slyke said.

First National terminals in stores may be affected however, a spokeseman there said. What is needed is a clarification of the ruling to determine which equipment is affected, according to Nick Poulos, who noted the bank recently implemented a limited transaction test program with Jewel Co. stores.

The ruling certainly affects the 10 CBCTs First National has scattered throughout the city and suburbs, Poulos said.

Daley Wants Branches Legalized

In the meantime, Chicago's Mayor Daley has introduced a bill in the city council that would legalize both CBCTs and community banking offices throughout the city of Chicago.

Daley's bill has not yet been passed, but will be voted on July 8.

Should it pass the city council, "it is almost sure to be dragged into court on the test of constitutionality," Van Slyke said.

Daley's bill would effectively exempt electronic banking machines from any branch restrictions. The proposed ordinance is based on home-rule powers granted to the city by the 1970 Illinois Constitution and would impose a special tax of .1 cent on each transaction made via the CBCTs or in community offices.

Sanders Demonstrates SNA/SDLC Interface

(Continued from Page 1)

with the Network Control Program (NCP/VS).

The 3270 SDLC frame structure was shown on a Spectron Datascope line monitor while the built-in frame monitor in the Sanders terminal was used to show the SDLC message on the screen of the 8170. The Sanders terminal can print a hard copy of the frame structure in local mode for later analysis while the 3270 can do this only with CPU intervention, a Sanders spokesman said.

Ready in January

The SNA/SDLC interface was described as a prototype with first deliveries scheduled for January. Production versions of the interface will have hard-wired SDLC capabilities built into hardware while other portions of SNA will be implemented in software.

The 8170 SNA 3270 emulation feature will cost $1,000 for an "average terminal cluster" or $50/mo on a one-year lease. Comparable IBM costs are $2,030 or $83/mo, a Sanders spokesman said. These prices do not include any costs associated with upgrading an IBM 370 mainframe to operate under SNA.

Users of the 8170 terminal can operate their terminals in binary synchronous mode and upgrade with the SNA/SDLC interface when they introduce SNA into their communications network, Sanders said.

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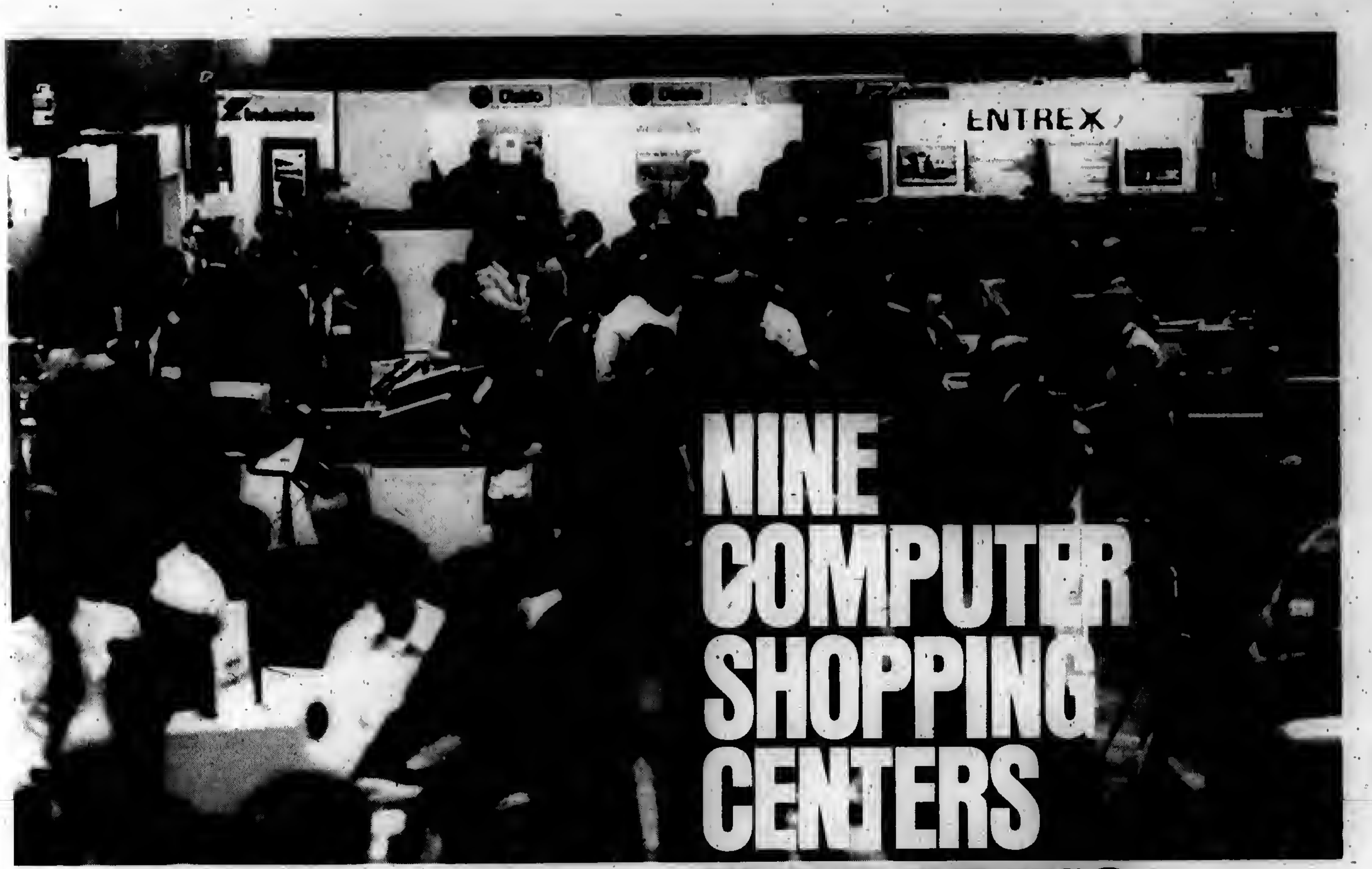

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DP-Based ID Cards Planned to Prevent Illegal Alien Entry

By Catherine Arnst

Of the CW Staff

WASHINGTON, D.C. – To help stem the flow of illegal aliens into the U.S., computerized identity cards will soon be issued to all resident aliens by the Immigration and Naturalization Service.

The card is meant to be a secure identification document which cannot be transferred or forged, according to Jerry Webster, program manager of the Alien Document Identification and Telecommunication (Adit) system.

There are approximately 4 million permanent aliens living in the U.S. and about 400,000 more are admitted each year. But there are 5 million or 6 million illegal aliens holding between 1 million and 2 million jobs and drawing an estimated $3 billion in wages, Immigration officials estimated.

Resident aliens currently carry a "green card" as a means of identiciation, "which is not a very secure card by any means," Webster said.

"There was always trouble in the past with counterfeit cards, altered cards or false photos," he said. A computerized system will almost eliminate those problems.

Unique Code

The Adit card that will replace the green card will contain a picture and fingerprint of the bearer, name, place of birth, date and place of admission, the mother's maiden name, the name of the oldest brother in the family and the immigration status.

All this information will be converted to six-digit codes which in turn will be converted by an encryption algorithm to another six-digit number that will be a unique code contained on the card.

The information on the Adit card will be kept in a centralized data bank which will be on-line and interactive, Webster said.

The data base will be operated by the Department of Justice's DP center with a few minicomputers scattered around the country, he said. Adit is currently estimated to cost between $13 million and $14 million for development.

The first cards were distributed in El Paso, Texas, on May 26 for a test run, Webster said. The design of the card and computer system has been going on for three years; complete implementation of the program should be finished in two more years, he added.

"The primary purpose of the data bank is for control at the port of entry. There will be terminals at all ports of entry which will allow inquiries to the file whenever someone presents his card.

"We intend to build a system flexible enough so that an employer can also inquire into the system about whether an alien is in the country legally or not," he added.

How to increase programmer productivity in a COBOL shop . . . for $30

When you think of it, programmer training is pretty haphazard. After a few language courses, a programmer goes into on-the-job training. Which usually means, he's on his own. So if he ever does learn to write efficient, easy-to-read, easy-to-maintain programs, it's largely through his own doing.

A few weeks ago, for example, I looked through the listings of several COBOL programs written by a senior programmer in a medium-sized System/360 installation. To my surprise, the programs were poorly written. They were written in an almost impossible to understand style; there was no structure to the programs; and there were many inefficient coding practices throughout.

My consultant friend tells me that this isn't unusual at all. In addition, he says all too many COBOL programmers are ineffective when it comes to testing and debugging. And they are dreadfully slow when they have to write unfamiliar routines.

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First, we have a COBOL book that is a programmer's guide extraordinaire. Because it illustrates and explains all the major types of routines that an applications programmer is likely to write, it can save hours of research time. Not to mention coding, compiling, and debugging time.

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Fourth, both our assembler language and COBOL books are loaded with down-to-earth, practical, real-world advice. It's like being able to talk to the lead programmer without interrupting his work. As a result, our books can provide job enrichment at the same time they increase programmer productivity.

Who These Books Are For

Although thousands of companies have bought our books for inhouse training, we believe they're equally good as programmers' guides.

In fact, we believe every System/360-370 installation can profit by having at least one copy of the appropriate assembler language book along with one COBOL book. At $30 for the pair, you don't need much programmer improvement to justify this investment. And in most shops, there's so much to gain.

For instance, the COBOL book covers subjects such as: how to design programs so they are easy to debug and maintain; how to use INSPECT and EXAMINE for isolating free-form input fields; how to improve coding efficiency by using the source statement library; how to improve processing efficiency by using SET and SEARCH for table handling; how to write and call subprograms; how to create and process indexed files; and how to use relative files for special file handling situations. This book covers DOS and OS considerations as well as 1968 and 1974 ANSI standards. Its only major omissions are sort, segmentation, and report writer.

As for the assembler language books, they include subjects like: how to write a subprogram that can be linked to a COBOL program; how to write a routine for bit manipulation or code translation when COBOL is inefficient; how and when to use assembler language for processing ISAM or direct files. And always, these books give that extra level of understanding that can turn an average programmer into an outstanding one.

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Editorial

Child of Competition

It is too bad some of the strong supporters of AT&T's Consumer Communications Reform Act did not visit a small booth tucked away on the third floor of the recent National Computer Conference.

If they had found the location they would have seen a modem introduced by Universal Data Systems (UDS) [CW, June 21]. Even the vendors of such units will readily admit a modem or data set is not the most exciting piece of equipment available to the communications user.

But this unit was significant because it pointed out the innovation resulting from telecommunications competition fostered by the Federal Communications Commission (FCC).

The modem from UDS operates at 1,200 bit/sec in full-duplex mode over a two-wire circuit. This type of product was pioneered in 1972 by Vadic Corp., and the UDS modem is the second of its type.

Both of these data sets allow a user to operate in full-duplex (two-way) mode over two wires instead of the four wires required by more conventional modems. Both Vadic and UDS are independent modem companies not afraid to innovate with products unavailable elsewhere..

At present, AT&T and the other telephone companies do not offer this type of modem. The Bell 1,200 bit/sec modems require four-wire facilities for full-duplex operation.

AT&T has been working on a data set that duplicates capabilities of the independent units. At one point, AT&T representatives reportedly told prospective customers of the Vadic modem Bell would offer a similar device soon..

Recently, however, AT&T said there were no plans to introduce this type of modem. Perhaps the telephone company will not introduce such a data set because it is more desirable to rent a four-wire circuit than a two-wire circuit to the user.

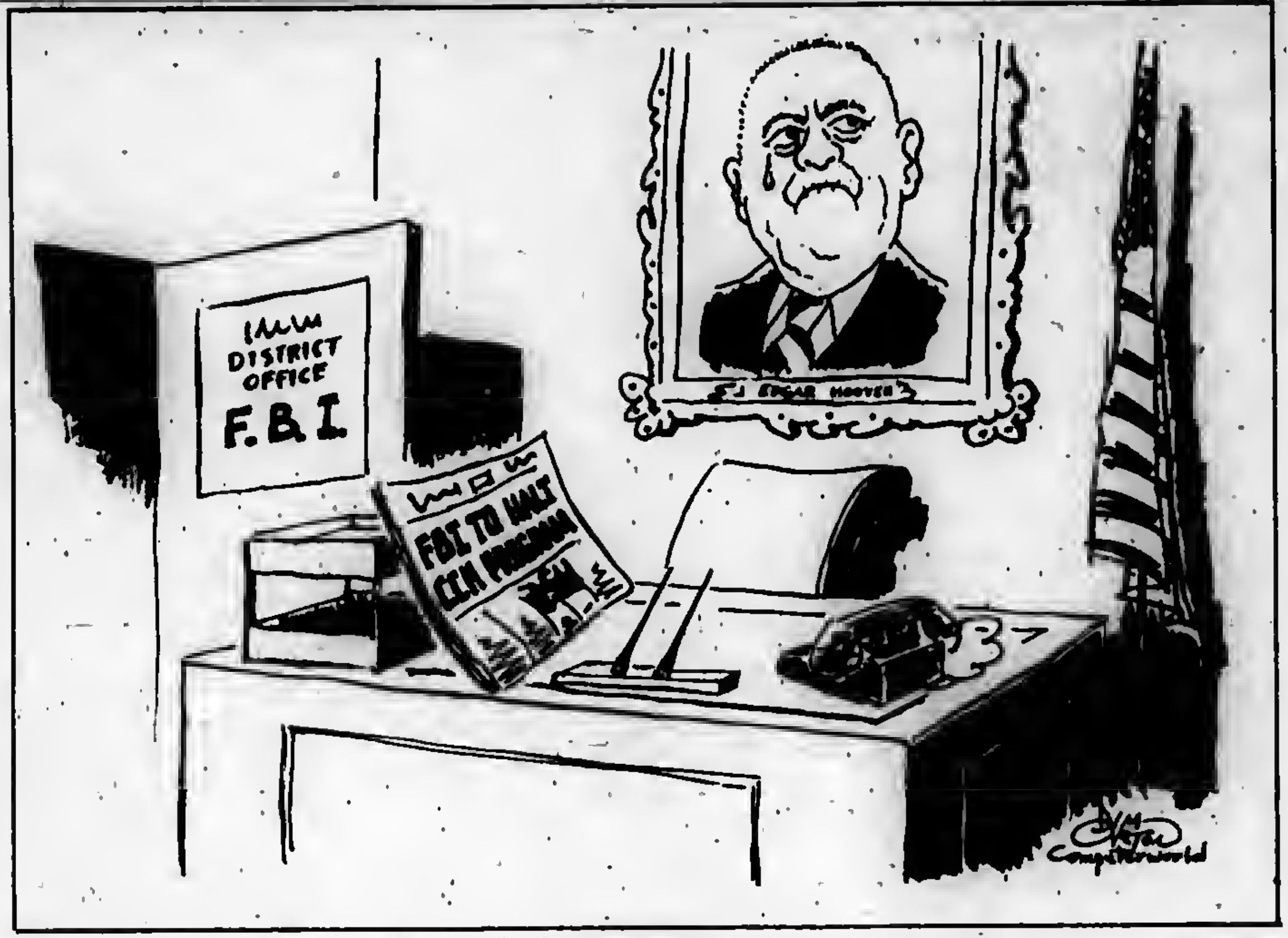
On the other hand, AT&T may have to react now that two independent vendors are offering a modem that is not in the phone company product line.

If the independent modems could not operate on the phone network (even with the Bell Data Access Arrangement), users would never have had these products. The reason they appeared is because of the FCC decisions that made it possible to interconnect noncarrier equipment.

As this story unfolds, AT&T will probably offer a version of these modems or, more drastically yet, it might offer the Vadic or UDS product with a Bell label on it.

Regardless of what happens, AT&T has not lost sales because it does not have a comparable product. AT&T may be forced to react to the efforts of two small suppliers whose products would never have appeared in a Bell-dominated monopoly environment.

Backers of the Reform Act take note: You are arguing against free enterprise and competition. Is that in the public interest?



Letters to the Editor

Let Bygones Be Bygones; Time for ACM to Get to Work

Now that Herb Grosch [CW, May 31], Anthony Ralston and George Glaser [CW, June 21] and Jean E. Sammet [CW, June 21] have gotten the stuff off their chests, the time has come to mollify the feelings and get to work, ladies and gentlemen of the Association for Computing Machinery (ACM).

Sammet's public statement that she accepts the election decision of the ACM membership and is prepared to cooperate with Grosch is exemplary; it sets the direction for the future.

I do not agree that the nomination by petition does not mean much, when such nominees win both offices – the president's and the vice-president's!

May I suggest an experiment to test this premise? In 1978, please choose a prominent, experienced and capable past president (or vice-president), nominate him or her for ACM president's post by petition and let's see what happens! Just to the contrary – election of nominees by petition constitutes a startling constitutional and popular mandate.

It is good to hear nobody (so far) wants the responsibility (now) for the preelection flyer with the signatures of past presidents and their unsuccessful election opponents.

A.V. Dundzila

Chicago, Ill.

Beware of Vendor Promises

Hats off to Peter Maraveleas in the article, "User Claims His Univac 90/60 Can't Compare With Spectra 70" [CW, June 21].

I wonder how many people in DP have become unemployed because they believed the statements of a marketing representative who is trying to make a sale.

Michael Thompson

Belle Chasse, La.

Death Not Result of DP Error

The headline, "Data Entry Backlog Cited in Death of Motorcyclist" [CW, June 21], is really in error and poor taste.

In the story, the motorcyclist was observed running a red light and, during the chase, a faulty report was received stating the motorcycle was stolen. Regardless of this, the person was still being chased for running a red light and would have been chased if the vehicle had not been stolen.

The fact that the entry was incorrect, missing, etc. really had no effect on the chase other than to add more charges to the original crime.

William McClanahan

Columbia, S.C.

Card Reader for IBM 3/8 Sought

Sinclair Community College in Dayton, Ohio, has an IBM 3/8 installed in its computer center. At present, we are diskette-oriented with this machine, but we would like to attach a punched-card reader to it.

The IBM representatives in Dayton tell me it is technically possible to attach a 1442 card reader/punch to the 3/8.

I am certain there are other people who are interested in attaching a 1442 card reader to their 3/8s. I would appreciate it if these people would make their needs known to their local IBM representatives.

After they have done so, I would like to have them notify me about their contact with IBM, giving specific details as to when the request was made and the IBM individual whom they contacted. I will then prepare a report on this situation for IBM which will indicate the specific market for card reader capability on the 3/8..

B. Albert Friedman
Program Director, DP

Sinclair Community College
Dayton, Ohio

Data Past

Five Years Ago
July 7, 1971

ATLANTA – A customer of the Control Data Corp. service center here filed an $8 million suit against the mainframe maker charging "false and fraudulent misrepresentations" and "erroneous processing" characterized the company's Cybernet time-sharing network. The customer, Computer Credit Systems, Inc. (CCS), alleged the "misrepresentations" included CDC's claims that the time-sharing network had adequate backup and that the service would cost less than the services provided by the previous service bureau used by CCS.

– – –

WHITE PLAINS, N.Y. – IBM announced the 370/195, which came with a projected price tag of $7.8 million for the cream-of-the-crop 4M-character model.

Eight Years Ago
July 3, 1968

WASHINGTON, D.C. – The U.S. Department of Defense indicated the problem of developing a "common interface between operational software and the data management and other supporting programs" as well as a "common man/machine interface" limited the possibility of the department buying computers from more than one manufacturer for the World Wide Military Command System.

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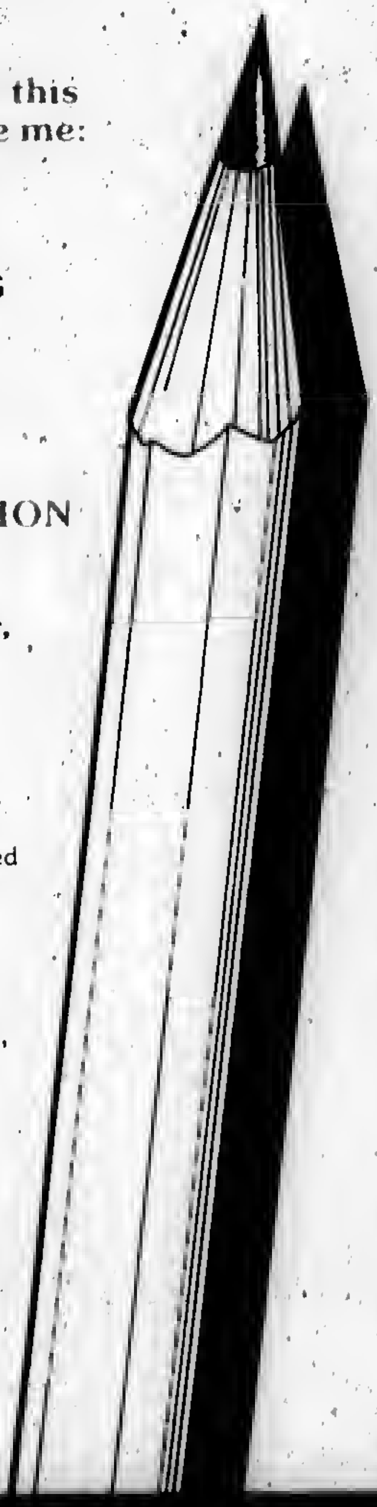

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Gerhard Neumann

Some months ago I did a column about one of the two men who most influenced my career in science, and then in computing. And next year, perhaps, I'll do one on the other, Wallace Eckert. Today, though, I am writing about another kind of man. Before I met him I was already set on course – for better or for worse! But there have been only a few men and women I've really admired in my career: Johnnie von Neumann, Watson Senior, Jack Jones perhaps – and Gerry Neumann.

Two reasons to tell about him today. The obvious one is that I met him, and his vigorous wife and partner Clarice, on Japan Air Lines the other day. Fifteen years, I'd guess, since we saw each other: terrific! But the other is that he reminded me, as vividly as if it were only yesterday, why General Electric failed so miserably in the computer business – and Philips in Holland, and Xerox and Singer, and to a considerable extent RCA and AEG/Telefunken. Neumann is a rock-hard living monument to a GE *success*, and to talk to him once more after all these years convinces me over again that GE could have succeeded in computers too. But in computers, it had no Gerhard Neumann.

Gerry (hard G) is today one of the ten top men in the gigantic $13 billion General Electric enterprise; as a vice president and group executive he heads all their work in jet engines and associated businesses, and reports directly to the presidential office. I forgot, in the excitment at Haneda when we recognized each other, to ask him how many men and women work for him now; must be anyhow 20,000. But Gerry isn't an ordinary executive, and it's central to the CW interest that he isn't a professional, highly-trained manager. What he *is* is a terrific leader, and one of the best jet engine designers ever, anywhere in the world.

Driven out of Hitler Germany, he became head mechanic for Claire Chennault in the China war theater. He put together scraps salvaged from shot-down Zero fighters and produced a working plane which could be evaluated and circumvented. At the end of the war, he was made a U.S. citizen by special act of Congress, at General Chennault's request. Meeting Clarice in Washington – she is a lawyer by profession – he carried her off to the Far East, and they honeymooned in a surplus jeep, driving overland to the Mediterranean. There were no IBM installations in Kabul *then*, believe me!

He worked for Douglas for a while, then came as one of the top engineers to the GE engine plant in Ohio. I had Card-Programmed Calculators when I first met him, and then the Number Six IBM 701. He and his design team were my biggest customers, and remained so when I put in two 704s, and remote data collection, and all the great goodies that the Dan McCrackens and the Don Shells could dream up, pre-even-FORTRAN. We had our battles; he was and is one tough, tough citizen. But we were both activists, both sure of our mission. His was to design and build engines efficient enough, durable enough, cheap enough to compete with giant Pratt & Whitney. General Motors (Allison) was faltering, Curtiss Wright and Westinghouse were clearly already out of the running. Neumann was determined to succeed. He drove his designers, he struggled to improve the enormously expensive test facilities, he personally laid out the first variable-stator prototype engines. He browbeat generals, many of whom were personal friends, and reluctant airline presidents. And he made it all come together; he and his people, many of whom have worked with him for over twenty years, and the solid Number Two in the world engine business, having passed Rolls Royce *en route*.

General Electric had a management philosophy. It said, among other things, that a trained and expert manager could manage anything: Memorex today is run by a graduate of that school. Gerry despised the idea; he *demanded* the engine business be run by someone who lived and breathed engine design, engine manufacturing, engine application: himself! It was close, very close; long after I left Evendale for the Phoenix computer department he was still struggling. With support from top executives who had been over him in Ohio, he got his chance – and General Electric stayed in aircraft propulsion.

Across the country, in computers in Arizona and in nuclear power in California and New Ork, the "professional manager" nonsense flourished. Men who could not have cared less for our exasperating but wonderful tool were put in charge in Phoenix, in Oklahoma City, in the Bull factories and offices in France. They had read the Blue Books, they had sworn allegiance to the Smiddy/Cordiner management philosophy, they worked diligently – but blindly. And they failed miserably.

Nor was it just IBM towering over them. There was no such opponent in nuclear power: just dumb Westinghouse. But similar philosophies failed there also. And Pratt & Whitney was surely the IBM of the engine field, yet Neumann succeeded. It took enormous expertise, enormous commitment, unrelenting toughness. And above all, it took leadership. Gerry had it, and the other things as well. It's good to have seen such a man.

Herb Grosch

In Word-Processing Applications

Use of Minis Provides Viable Alternative to Maxis

The Taylor Report
By
Alan Taylor, CDP

Five-year-old exhibitions generally show either the staying power of the industry segment involved or else demonstrate obstinacy in the face of apparent failure.

Syntopican V, an exhibition held in New York City recently, seems to be in the "successful" category and was an illustration of how small-scale computer logic has been developing in the word-processing field.

Beyond that, however, just about every Syntopican booth raised the question of how the future desktop machines would communicate with the larger maxicomputer systems.

That they would do so in the near future was clear, but whether it would be over network wires, on a real-time basis or by periodic batch transfers was anybody's guess or at least a decision that varied with the economics of the particular situation.

One approach, however, struck me as being of general interest, because it suggested an alternative way of thinking about the provision of in-house maxicomputer capability backups. The first part was shown on the Base Information Systems stand. The rest was promised by the firm in a few months.

Base's System

What could be seen was a cluster approach, with up to eight desktop Hewlett Packard Co. (HP) 2640A terminals surrounding a Honeywell Level 6 minicomputer. The terminals were served by Ultra-Text word-processing software with good page-header, footnoting, sub- and superscripting operations, all in the traditional manner.

Ultra-Text has a number of features I like, both for themselves and also for the way that they show progress is being made. For instance, hyphenation – the last time I looked, some of the results of automatic hyphenation were not looking very good.

At the same time, frequency of interruption needed for manual hyphenation was distinctly bad. The question arose whether a mini system could handle the facility.

The answer in Ultra-Text turned out to be a combination of use and simple routines which makes the manual burden acceptable:

- The use of the system is generally for full-width documents with 60 or more characters, together with a certain amount of flexibility (the "hot zones") which reduces the need for any hyphenation.
- The software includes some of the simpler hyphenation rules – double consonants, etc. – and applies them whenever possible. This turns out to be fairly often.
- Manual calls for hyphenation help only occur after neither the hot zones, nor the rules have proved capable of handling the problem.

What I like about this is that the solution has been found to be through simplification of both the requirement and the routines themselves.

This is a case of understanding the application better, rather than having to discover new, highly sophisticated operations. There is less chance of going wrong this way, and reliability is what we need above almost anything nowadays. And the approach is suitable for in-house maintenance and even development.

Extensions to System

What Base promised, but will not be seen for a few months yet, was the addition of a couple of backup related operations to handle the documents being created and stored. These are In-Dex and Context.

In-Dex creates indices. It currently works on 360s or 370s. In itself it is a fully integrated system, with capability of microfiche outputs, sorts and searches. But In-Dex is a maxi system application, rather than a mini system one. And there still is a difference. It uses plenty of main memory, but won't always be operational, so memory costs could be high.

Context is also a maxi system application. Context doesn't deal with indices, but rather with full-text operations – large data bases, proximity searching, free use of synonyms, etc. That's far from a mini operation, needing big disk capability, etc.

And these three, Ultra-Text, In-Dex and Context, are all to be integrated into a single, cohesive, user-oriented system, according to the brochure. So let's look at the economics involved. Where is the equipment to come from to handle these maxi-size applications on a mini?

The answer appears to be in the use of an in-house cluster-supported group of terminals. Here the local need for systems is sufficiently strong that a good size mini, with good operating software, is economically self-supporting. Ultra-Text isn't cheap ($20,000 for the first unit; than $18,000 or $16,000 depending on the size of the cluster); but it can support the mini.

So the mini doesn't have to be bought to support the maxi applications. Instead it simply has to be expanded. And expanding already available minis is even more economically reasonable than using minis in the first place.

Here is where I see the approach being successful. As minis come down in price and up in sophistication, more and more basic in-house applications, such as controlling word processing, will be justified.

The moment such a justification appears, the additional power available by expanding the in-house mini hardware becomes very attractive and powerful – well able to economically challenge the use of maxi systems for even quite complex related operations.

This is what is happening here. Whether or not Base will succeed we have yet to find out (but I'll keep you informed of developments). But what is happening is in-house systems analysts have yet another competitor to consider – the expanding mini.

This is much cheaper again than just a mini in its own right, and may well have all the systems challenge and flexibility of the maxi system at very economical prices.

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Another 'Project Which Failed' Shows

User Often Only Difference Between Success, Failure

By Miles Benson

Special to Computerworld

The Sociology Of Computing

Perhaps I'm a little too close to this "Project Which Failed" to do it justice. Just looking through the musty files in my basement, where I have stored the last remains of Interpol, causes a kind of pall to descend on me.

Over there, on the shelf in the corner, are the listings, several inches thick. That layer of dust on top tells you how often I've looked at them lately.

But here, in my hand, is the really painful part. It's just a binder with a bunch of papers in it, but the papers are the history of all the little events, good and bad, that occurred along the way to the end of Interpol.

Let's thumb through them together. There might be something to be learned in those pages. That's the whole point of a "Project Which Failed" story, I guess.

"Proposal – Fast PLYI Interpretive Compiler" is the title of the first one. It's dated 10 years ago; that was when it all started. The ideas that expanded Into the dreams that solidified into the implementation of an interpreter for the PL/I language are documented there, neatly, a little bit sales-pitchish, but well thought-out.

"PL/I is inevitably the language of the future," it says. "Let's experiment with interpreters as tools to give better programming debugging tools," it says. "High-level languages can be used to do systems programming," it says. A collection of ideas, addressed to a decision maker, saying, "Give me a green light on this project."

Between the first few pages of the binder there's a lot left to the imagination. The green light was turned on, but there's no record of it.

Here, though, is the first status report, three months later. "Right on track," it says. "Hard stuff designed, basic stuff implemented," it says. "Let's do the following in the future," it says.

And only one page and three months further on is an exciting one. "'Interpol – Scientific PL/I Interpreter – is now usable," it says. "It lacks a few things," it says. But "try it out," it says.

Here's a meeting announcement, yellowing a little but still readable. "Topic for Technical Staff Meeting This Month – PL/I Interpretive Language Development." A collection of people to review progress in a little more depth.

The next few pages in the binder aren't very interesting in themselves – a bunch of notes, scrawled across the page and sideways in the margins. But these are the rough-hewn forerunners of Interpol's finest hour.

On the following page, here, is the finished product, a paper which was distributed at the PL/I conference that year, telling about Interpol and its design goals and its implementation technique and its special features. And a couple of pages further on, here's the same paper, polished up a little more and published in a leading professional journal.

The next many pages are the glory road through the binder. Letters from readers, sharing insights. Requests for reprints, many with exotic foreign stamps. Inquiries about system availability.

Even now, reading them over, I feel my ego climb several meganotches. "The internationally known computer scientist," I only half-jokingly thought of myself.

Like Grains of Sand

Have you ever poked a stick into a sandbank and watched the sand begin to slide downwards, a few grains at a time, then more and more, until a column of sand above the poke-hole is moving like an avalanche?

Well, the sand was eroding under Interpol, gradually at first, all the time that fame was trumpeting its name to the far countries of the earth. Back home, where usefulness and not reputation is the measure of a project, Interpol was on the road to failure.

The clues in the aging binder are like those grains of sand, showing up slowly. Here's the Interpol user manual, a "how-to" description of the system and a questionnaire sent out with it to evaluate user reactions.

Now, common sense says that next in the binder there ought to be a flock of user questionnaire responses, and perhaps even a questionnaire response summary.

They're not there. Clue Number One. Something is wrong in the potential user community; no one seems to be using Interpol.

Instead, in the binder, there's a quickened pulse of implementation notes, nits and grits and exotica on adding various PL/I features to Interpol, now totally useless but vital and alive when they were written. But still no user responses.

And, even more ominous, there are no analyses of user problems. You can't produce a project like Interpol and do it error-free. No user questionnaires; no user problems; the only possible answer to the riddle is *no users*.

The memories of that realization, flooding back as I look at a page marked "DO WHILE Implementation," blur the page for a moment. The fame of the published paper, the ego pinnacle of the project, is caught now in that ever-faster sliding column of sand.

The worry about lack of users takes a more scientific form now. Here's a follow-up inquiry page in the binder asking what is wrong; calmly, factually ferreting out the reasons why Interpol is an object of user disinterest. Minutes of meetings with responsible managers; notes on discussions with top technical types; the pieces of the answer puzzle begin to fit together.

Into a whole, labeled "Final Report on Interpol Project," the next page in the binder. "Users are busy," it says. "Deadlines for programmers are tight," it says. "Users haven't time to try new techniques," it says.

Crash. The last of the sand has hit bottom, and here lies Interpol, tangled into the heap.

In this bastion of real-worldness, where getting the job done is more important than learning to do the job better, innovation is a kind of dirty word. Interpol was innovation. So, for that matter, was the "inevitable" PL/I. And no one had the time to touch them.

When I slam the binder closed, dust rises and that musty smell of aged paper fills the air and the nostrils. Here, next to that copy of "Compiler Implementation" I used for ideas in the Interpol project, is where it goes on the shelf. I guess I'll probably never need to take it down and look at it again.

Interpol was a "Project Which Failed," all right. Right in the middle of the most success a project can ever have. It makes me wonder, when I read the computing literature, how many of those projects, so glossy and elegant on the slick pages of leading journals, are really successes?

And how many, when you get right down to it, are failures as well?

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Although Settling on One System Helps

Easy Installation Causes Some Strains, Users Discover

By Don Leavitt
Of the CW Staff

NIAGARA FALLS, N.Y. – Working with an applications system that is technically easy for the DP staff to install can be a "semitraumatic" experience for some users, according to Jim Biani, management and information systems (MIS) director for Carborundum Corp. headquartered here.

Many users have become hardened to a delay between the time they tell the systems analysts what they would like and when a system is delivered. When such a delay doesn't occur, the emphasis within the development cycle changes, and "80% of the effort" falls on the user, Biani continued.

Under those circumstances, real decisions have to be made by the user and usually much sooner than expected. And that is a tough change of pace, he said.

To help the situation, because under Biani's leadership Carborundum is using an easy-to-install application system, he has put together a DP staff made up of "people I thought had business sense first and who, almost incidentally, knew how to use" a computer.

"In an MIS function, the people who are 'selling' – working with and installing – the systems have to be really cognizant of the functional areas in which they are operating. You'd be hardpressed to go out with the typical 'computernik' and install these systems," Biani said.

MAS Found by Accident

Biani is referring to the Modular Application Systems (MAS) from Martin Marietta Data Systems – and he is enthusiastic about that software – and locally built extensions.

Carborundum's conversion to a user-conscious operation started about three years ago. And it was almost by accident that it involves MAS.

When Biani joined Carborundum. in 1973, the corporation's DP capabilities were scattered across the country on a mixed collection of small systems and sometimes clashing operating environments.

Since that approach was clearly inefficient, he saw two needs: a new hardware/software configuration in a new production-oriented facility and a new staff profile. He wanted a new facility because he knew he couldn't "sell" any service capability if he couldn't produce. The selection process took time, but the corporation now has a 1M-byte 370/158 under OS/VS2, supporting 30 high-speed remote job entry (RJE) terminals in remote Carborundum locations.

He brought in "a bunch" of "very specialized technicians who were very good at converting programs and bringing things from a mixed bag to OS mode operations." They have since become the basic operations staff at the 370 center.

Used Diagram as Vehicle

The business-oriented staff was put together next and then Biani and his colleagues began to get specific about what they wanted to provide for the corporation.

Instead of the existing essentially unstructured approach to DP, they envisioned a basic "schematic" diagram of what basic systems they wanted and how they should logically fit together.

The diagramatic approach gave Biani a vehicle – "a language, if you wish" – with which he could talk to non-DP users and be sure of his understanding of their problems before he made a false move. But he seemed unable to find any commercially available software that coincided with his vision of Carborundum's needs.

Then luckily – as it turned out – they had equipment problems and went to a local Martin Marietta data center for machine time. "We got talking, and they mentioned MAS," Biani recalled. "As we talked further; I could see that if we laid the MAS schematic over ours, the fit was so close it was almost scary."

As Carborundum looked closer, the fit seemed even better. MAS didn't cover all the areas Biani had defined, "but it covered the bulk of them and especially the critical nonaccounting areas that would have been most difficult for us to develop."

The internals of the coding "couldn't be called 'super' in terms of mechanical efficiency," he said, "but they were certainly satisfactory." And the modularity meant it could be brought up piecemeal and mixed, where appropriate, with Carborundum coding.

That was important because Biani wanted his staff to be self-sufficient in customizing and maintenance and free to use their own code when MAS didn't fit the company's needs. In fact, though "15 to 20" of the MAS modular elements are in place in various Carborundum locations, the company does not use any of the vendor's financial control programs.

Having "embraced" MAS and its own "schematic" of how systems should go together, Carborundum's management committed itself to support of Biani's approach with publication of a printed and illustrated booklet on System Development Methodology [CW, April 26] which was distributed to all interested people within the company late last year.

IBM Drops Support for OS/MFT, OS/MVT

WHITE PLAINS, N.Y. – IBM has finally dropped the other shoe. Having withdrawn support for DOS several years ago, the vendor has now said support for OS will be phased out in two steps next year.

The change from Class A to Class C support applies to both multiprogramming with a fixed number of tasks (MFT) and multiprogramming with a variable number of tasks (MFT). The change will take place next May 31 for releases 21.0, 21.6 and 21.7 and Nov. 30, 1977 for Release 21.8, IBM told its OS installations.

MFT and MVT were first delivered by IBM in 1966 and 1967. Used on the larger IBM 360s and the nonvirtual 370s, they became OS/VS1 and OS/VS2 in the vendor's newer series of operating systems.

Four years ago IBM told users Release 21 would be the last major "functional" release of the control software for "real" memory 360s and 370s. But it put out several maintenance subreleases until two years ago when 21.8 was delivered and IBM said that was the end of the line.

Under IBM's terminology, Class A support includes centralized programming effort for both enhancements and error corrections and, if needed, free on-site personnel to solve a problem traceable to the IBM software. Class C rules out all free support, but programming and systems engineering services are available at a cost to the user.

If modifications are already available for a problem just discovered by a user, the coding change will usually be provided without cost, even under Class C. In addition, user groups such as Share and Guide have accumulated substantial libraries of OS changes that are available to their members at little or no cost.

Though IBM won't provide support for new problems within OS reported after the change to Class C, the vendor will accept reports of problems up to the changeover date and, if IBM is at fault, provide support free to the user.

In addition, if the experience with DOS is any criterion, the end of IBM support for OS may well signal the beginning of a number of OS enhancement packages from independent software firms.

For its part, by downgrading support for the older operating systems, IBM presumably can reassign the OS programming staff to other tasks. However, since Relase 21:8 was delivered in August 1974 with the understanding that it was the final release, some observers believe there may be little staff left for reassignment.

Other observers consider IBM's abandonment of its older operating systems as a clear indication of the vendor's concern over a current-day problem: the specter of competition from Amdahl Corp., which has already replaced several large 370s and apparently is close to receiving an order from a major manufacturer for as many as 20 470V/6s.

Package Backs Unattended B700 Compilations

OLIVET, Mich. – Installations with Burroughs Corp. B700 computers can schedule and initiate batch compiling of RPG or Cobol programs to be run in unattended mode with the 700BC package, according to the developer, Leo M. Weeks.

The package is a five-program system capable of taking source programs from disk, Weeks said, adding that such a capability was previously unavailable to the B700 user. Up till now, source programs had to be entered on punch cards, requiring an operator to be present, he said.

With 700BC a conversational program sets up a list of programs to be compiled, with their respective options. Once initiated, the Weeks' program takes control of the system, operating without the need for an operator, the developer added.

All programs on one disk can be compiled just as if they had been stacked in the card reader. In addition, 700BC spools the output of the Cobol compilation back to disk so that listings, for example, can be printed the next day when the operator is present to watch for paper jams or other mechanical problems.

While the package can be used to manage a series of consecutive compilations, according to Weeks, its prime value may lie in its ability to run long compiles during nonworking hours, providing more time during the day for normal processing.

The 700BC package is now available for a one-time license fee of $600, Weeks said from 23716 Twenty Mile Road, Olivet, Mich. 49076.

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'CAP' Aids Builders With Datapoints

FALL RIVER, Mass. – The general ledger is the heart of the Construction Accounting Package (CAP) recently announced for Datapoint Corp. computer systems from Bristol Information Systems, Inc. (BIS).

Operating in a conversational, transaction-oriented mode, CAP is said to be a fully integrated system handling all payroll, accounts payable and ledger processing. More than 50 reports provide management with cost, budget and "profit-and-loss" analysis for any number of independent projects and subprojects, BIS said.

The system can also be extended through the use of separately priced billing and accounts receivable and fixed-asset accounting options and a set of modules to put the whole system on a time-shared basis under Datashare, the company said.

The projects can be integrated into the master ledger for each corporation or division. Divisions and corporations can also be consolidated in any configuration horizontally or vertically, the vendor added.

Outputs Labor Distribution

The payroll system, besides doing all the classic calculations, outputs full labor distribution for each employee to as many accounts and projects as needed. The system then posts each transaction to the correct account and ledger.

The accounts payable system spreads each invoice to as many accounts or projects as needed before paying it. Multiple companies with multiple projects can be posted, and cash flow and due date analysis aid management in day-to-day operations, according to BIS.

The ledger system itself supports budget vs. actual comparisons and an audit trail of all entries by source and account number. A report generator makes data accessible in user-specified formats, the vendor added.

The system runs on any Datapoint 1100, 2200 or 5500 running under Datapoint's DOS and having a 132-position printer. The package in object code costs $5,250 and can be ordered from BIS at P.O. Box 2133, Fall River, Mass. 02722.

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Confab to Consider Compliance

PONTE VEDRA BEACH, Fla. – A meeting of the Magen User Group (International), planned for the Ponte Vedra Club here Aug. 8-12, will provide four days of technical sessions for mathematical programmers, according to the conference sponsor, Haverly Systems of Denville, N.J.

The symposium will include a session aimed at formation of a work group with the goal of using the computer to help organizations comply with government regulations of all sorts without devoting excess resources to the compliance effort.

On the other end of the scale, the agenda also includes special interest sessions for the petroleum and petrochemical industry and for the forest products industry, a Haverly spokesman noted.

Other sessions will be on distributed planning and on management and training, he said. There will also be a special tutorial on the use of operations research as a tactical weapon for business planning, he added.

The symposium registration fee is $100 and hotel accommodations – American Plan – at the club are an additional $244, Haverly said from 78 Broadway, Denville, N.J. 07834.

3270 CRT Replaces 1052 As Console Under DOS/RS

SCHILLER PARK, Ill. – Support for an IBM 3270 CRT instead of a 1052 typewriter as the console for a 360/370 is one of the enhancements built into Release 6.4 of DOS/RS now available from Dearborn Computer Leasing Co., according to a spokesman.

DOS/RS was designed as a replacement for IBM's DOS. In its fullest implementation it supports up to three batch partitions and three special partition sections for ongoing tasks such as spooling and teleprocessing on CPUs with at least 128K bytes of memory.

Proprietary spooling software, as well as coding to interface with most commercially available teleprocessing monitors, are built into the DOS/RS package, the spokesman added. Support for inter-partition scheduling and resident directories and transients are also in place, he said.

Additional Features

Release 6.4 includes a feature that permits coupling two CPUs sharing the systems pack and other data files and a new cataloged procedures facility that is said to replace the source library inclusion feature in IBM's Power spooler.

Beyond that, DOS/RS now supports a generic ASSIGN facility to select recording density for tape files and a converter program "that helps take advantage of improved JCL capabilities under DOS/RS," Dearborn claimed.

Although originally developed to support Dearborn's leasing business, DOS/RS is "very definitely" available to installations that already have equipment, but are seeking control software better than IBM's, the spokesman emphasized.

Release 6.4 can be installed under a permanent license agreement for $12,500 or leased for $400/mo on a 36-month plan, the company said from 4849 N. Scott St., Schiller Park, Ill. 60176.

Multiprogramming Backed By Bunker Ramo Software

TRUMBULL, Conn. – Bunker Ramo Corp. has introduced software for the company's Bank Control Systems 90, an on-line teller terminal system now being installed at user sites.

The software includes an operating system, applications programs, IBM 3270 compatibility and customer programmability, the company said.

The Bank Operating System (BOS) is an on-line multiprogrammed system for the System Programmable Control Unit (PCU). It supports reentrant code and dynamic priority assignment based on processing need, a spokesman added.

The Program Support Package (PSP) resides in the user's host computer and is provided to simplify programming of the System 90 PCU. This part of the package is said to include a "comprehensive" cross-assembler, a librarian and linkage facilities, in addition to a loader for the PCU.

Bank Transaction Package (Banktran) is the 3270-compatible applications subsystem of the System 90 software. Individual bank variability such as transaction sequences, CRT display masks, journal data and validation formats are handled by Banktran, the spokesman explained.

Banktran can be used to selectively enable and disable appropriate keys at the System 90 terminal. The system also protects specified fields in the CRT display mask used to guide the teller and accepts only appropriate data in the sequence desired, Bunker Ramo said.

With Banktran, if the host communication link is inoperative, transaction data can be logged to an optional System 90 disk drive for later automatic reentry when the system resumes on-line operations.

At any time, a teller may request his cash position, a listing of as many as 15 totals or an itemized list of transactions that make up any total.

Bunker Ramo's Information Systems Division is at 35 Nutmeg Drive, Trumbull, Conn. 06609.

Datasystems Used for CPM Work

AMES, Iowa – The Critical Path Management (CPM) Reporting/Charting System from Compas, Inc. was designed for builders, contractors, job shops and others who need close control over job scheduling, the vendor said.

Implemented on Digital Equipment Corp. Datasystems equipment, the software is said to accommodate 999 activities and to calculate earliest start and end times, latest starts and ends and total and free floats.

In addition to computation of optimized job schedules, the package supports the printing of scheduling charts "suitable for wall mounting," the spokesman remarked. This output may be a complete rundown of a job or a partial listing by type of activity or time period within the job's total duration, he added.

The software runs on hardware as small as a Datasystem 310 with 8K main memory, two floppy disks and "any" printer available from DEC, Compas said from 413 Kellogg Ave., P.O. Box 687, Ames, Iowa 50010.

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Cobol Proposal Aimed at Formalities

By Alvis Zuntaks
Special to Computerworld

"New Verb or PERFORM Change Proposed" by Patrick V. Reese and Susan J. LeVine [CW, June 7] once again showed the preoccupation of structured programming proponents with formalities rather than substance.

The coding of dummy paragraphs appears wasteful and I also dislike unnecessary coding. But I am willing to code even two dummy paragraphs because the use of the PERFORM paragraph name without the THRU option is much more objectionable.

During the lifetime of a program, many paragraphs tend to grow into more than one, specially since there is a new and worthwhile use of the GOTO statement – to break up overgrown, unmaintainable IF statements.

By looking at the example presented in the Reese/LeVine article, the following observations can be made:

- It is commendable to use the previously obtained actual table size IDX2.
- By using nonstructured programming, however, the example can simply be written MOVE IDX2 TO IDX1.
- Assuming a proper search argument is used and that, at the completion of the PERFORM, IDX1 is +1, what happened? Well, it may have found an equal in the table, but then it may not.

A more reliable version of the example would be:

```
PERFORM DUMMY THRU DUMMY-EXIT
 VARYING IDX1 FRDM IDX2 BY -1
 UNTIL IDX1 < +1 OR
 TABLE-ENTRY (IDX1) = SEARCH-ARG.
   .
   .

DUMMY.
    EXIT.
DUMMY-EXIT.
    EXIT.
```

The suggestion of the VARY verb or NULL instead of paragraph name seems appealing, but it would result in the increase of the list of reserved words, which is a plague to the maintenance of previously written programs.

Zuntaks is with Versa Management Systems Ltd. of Toronto, Canada.

RPG-II Course Available

CANOGA PARK, Calif. – An audiotape and workbook training package from Informatics, Inc.'s Group/3 Division, *RPG-II Techniques of Programming (RPG/TOP)* provides a general introduction to the language.

Average time required to complete the $150 course is about 16 hours, the vendor said.

Group/3 is at 21050 Vanowen St., Canoga Park, Calif. 91304.

SEARCH Approach Called Better

By T. Jeff Byrum
Special to Computerworld

The function in Cobol that Reese and LeVine are actually seeking [CW, June 7] is neither PERFORM nor VARY, but actually SEARCH. The clause "BY -1" in their example causes a simple serial search of TABLE-ENTRY, only in reverse order.

Searching in ascending order would be simple with the ANS Cobol SEARCH verb. If logical considerations require searching the elements in the sequence indicated, then storing the table in reverse order and using SEARCH would solve the problem.

However, assuming that some problems might actually require a reverse order serial search, why add a new verb and a new reserved word to the language? I propose adding a new SEARCH facility with an existing reserved word:

```
SET IDX1 TD IDX2.
 SEARCH REVERSED TABLE-ENTRY
   AT END
     MDVE '1' TD NOT-FOUND
   WHEN TABLE-ENTRY (IDX1) = TABLE-
   ENTRY (IDX2)
     NEXT SENTENCE
```

Byrum is assistant systems officer at Bankers Trust Co. in New York City.

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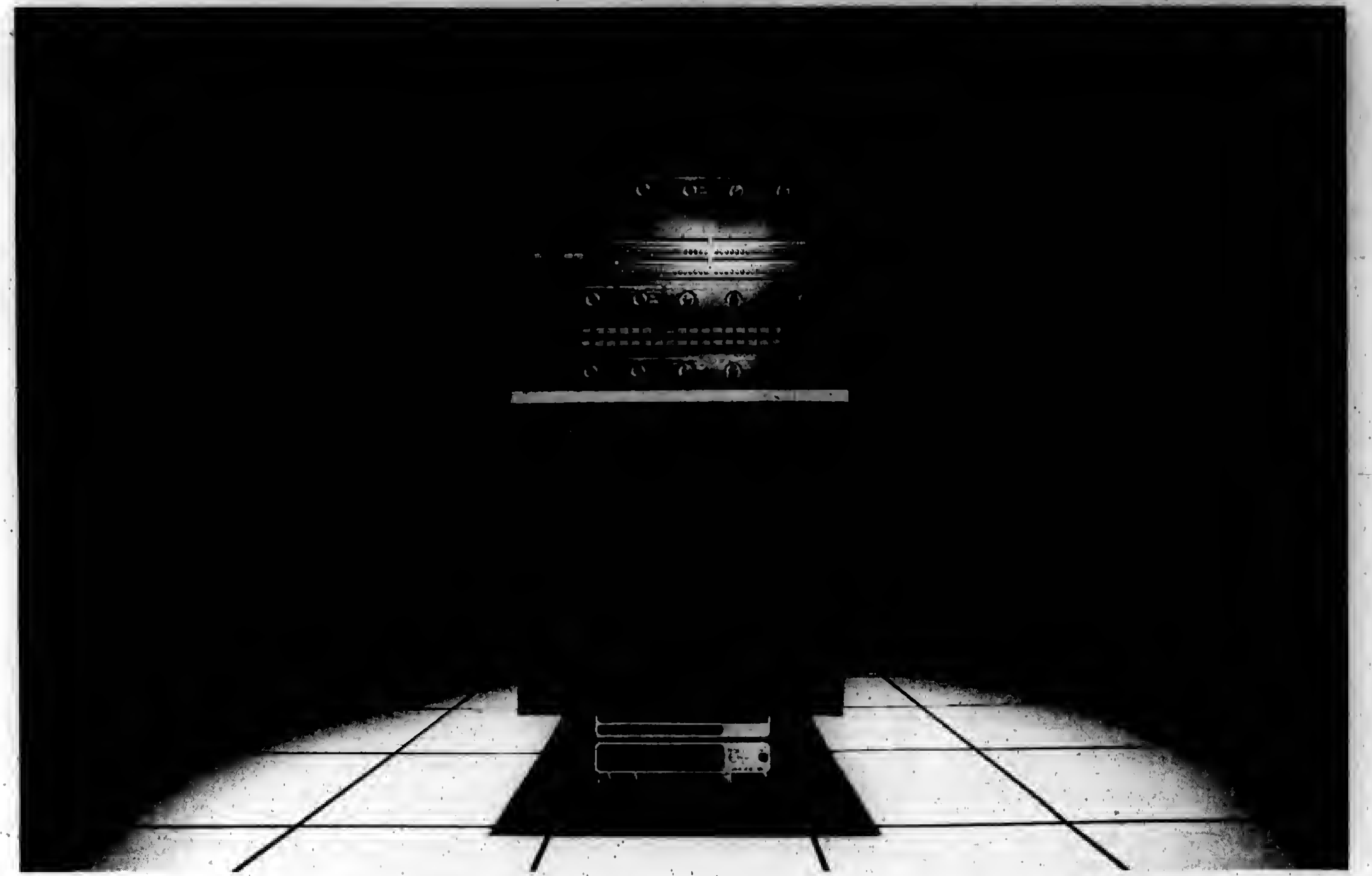

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Combines 50-, 56 Kbit/Sec Units

International Satellite Circuit Connects Nasa Sites

By Ronald A. Frank
Of the CW Staff

GREENBELT, Md. – The National Aeronautics and Space Administration (Nasa) has configured an international two-hop satellite circuit that combines 50 kbit/sec and 56 kbit/sec facilities in the same link.

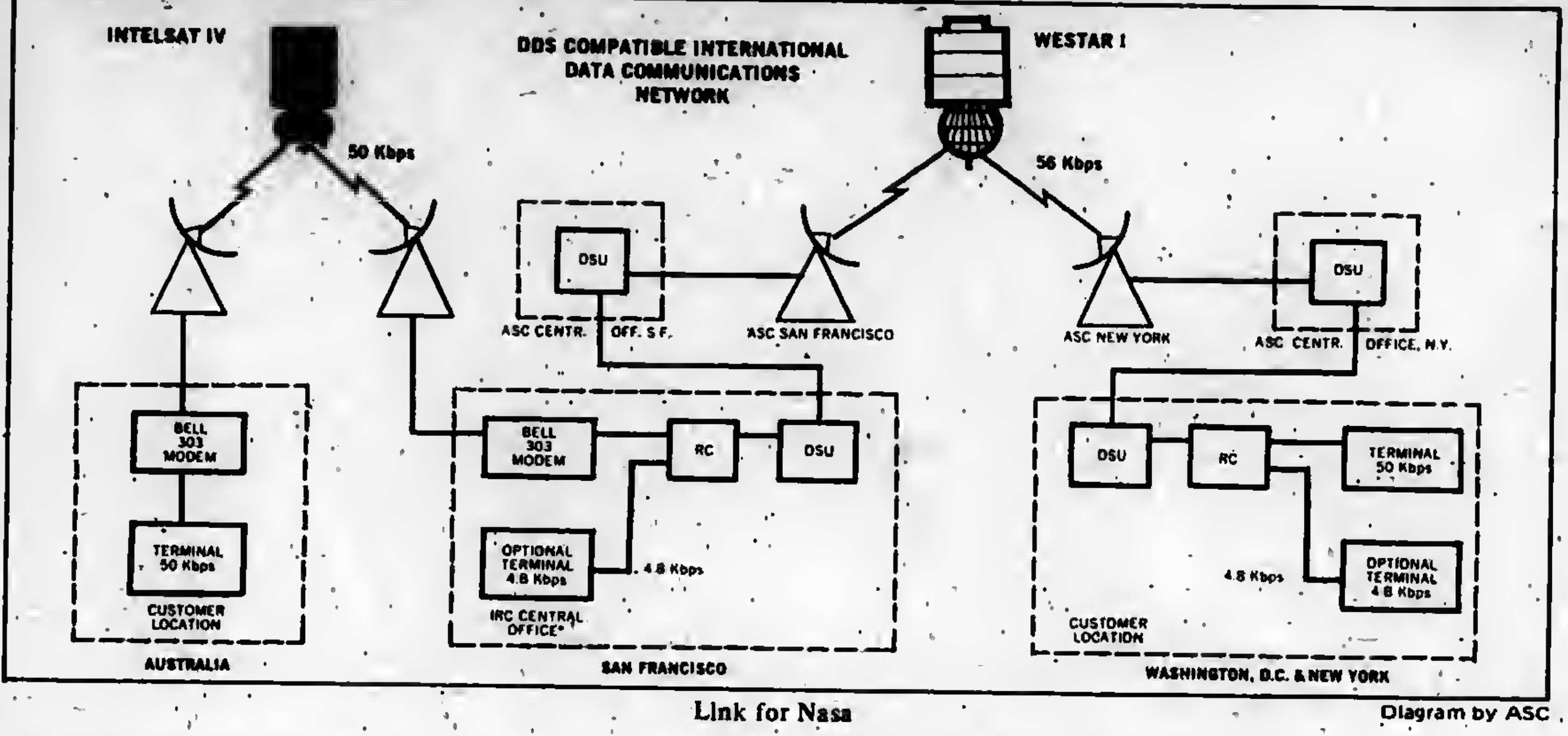
The international link connects the Goddard Space Flight Center here with a Nasa site in Australia. The link combines both digital and analog facilities and uses terrestrial synchronous as well as satellite asynchronous circuits to complete the data transmissions.

The major portion of the satellite link is handled by American Satellite Corp. (ASC) for Nasa. Most of the data on the link is routed from Australia to Goddard and is used to obtain readout data from various Nasa satellites and to send command signals to both earth-orbiting spacecraft and space-probe vehicles.

Although the application is much more complex than the average user would need, the configuration of the international link over two satellites could apply to any international user, ASC said. Another similar link will soon be configured for a transatlantic business user, an ASC spokesman said.

From Australia data is transmitted out of a Univac 642B CPU to a Bell 303 data set. From there the data is transmitted by the Australian Telecommunications Commission via terrestrial facilities to a Comsat General Corp. earth station and up to the Pacific Intelsat IV satellite which provides a 50 kbit/sec circuit.

The data is received at a Comsat earth station in California and routed over an RCA link to the ASC central office.



Link for Nasa

Diagram by ASC

Data from the satellite is received in analog format at 50 kbit/sec, sent through a Bell 303 data set and then through a special one-port multiplexer "rate converter" which makes the transmission coming in at 50 kbit/sec compatible with the 56 kbit/sec transmission rate used by ASC on the Westar I satellite.

'Elastic Buffer' Used

The speed translation is accomplished with an "elastic buffer" which holds 1K bits and can compensate for a number of factors including varying propagation delays of the satellites, according to an ASC spokesman.

The signal coming out of the rate converter at 56 kbit/sec is sent through an AT&T Data Service Unit (DSU) and onto a Dataphone Digital Service (DDS) circuit between the RCA office and the ASC terminal on the West Coast.

At the ASC site, the signal is passed through another DSU and converted from digital form back to analog for transmission to the ASC earth station.

The signal is transmitted over Westar by ASC at 56 kbit/sec to an ASC earth station on the East Coast. From there the data is sent to an ASC central office where it is converted from analog to digital form through a DSU.

Using another DDS circuit, the data is sent to Goddard and into a second DSU and then through a second synchronous rate converter.

The converter also breaks down the 56 kbit/sec DDS synchronous timing into a 50 kbit/sec rate used for the Intelsat transmission. The converter utilizes bit-stuffing techniques for the speed translation process, an ASC spokesman said. The satellite transmissions are basically asynchronous while the DDS circuits use synchronous timing from a master network clock, he said.

After passing through the converter, the data is received by a Univac 494 CPU at Goddard. The entire link provides the user with a transparent data path and all timing is synchronized with the DDS clocking on both the domestic and overseas portions of the link, ASC said.

Nasa has been using the two-hop satellite link since last March with few problems. Data is transmitted in a packet-switched mode developed by Nasa, according to a spokesman.

There are no problems caused by propagation delays since most of the traffic is transmitted one way in batch mode. The packet protocol used by Nasa is not compatible with other packet transmission methods, the Nasa spokesman said.

Since most of the transmissions are one way at a time in batch mode, there were no software problems as might have been encountered over an interactive transmission pattern over a satellite circuit, the Nasa spokesman said.

The packet-switched messages do have error-detection procedures, but no error-correction procedures. If an error is detected in a packet block, the packet is flagged and it can either be retransmitted or it can be omitted from the overall data as required. Since spacecraft tracking data is often highly redundant, it is possible to disregard error packets in certain cases, the Nasa spokesman said.

Network Enhances Control of Divisions

By John P. Hebert
Of the CW Staff

DAYTON, Ohio – A large restaurant chain is installing a point-of-sale (POS) terminal communications network to bring its corporate computer processing power and services "full circle."

Ponderosa System, Inc., which operates and licenses over 500 steak house restaurants, has 33 NCR Model 250 intelligent terminals in place, according to Ray Florence, the firm's director of management information systems (MIS).

Ponderosa plans to have 103 of these 16K-bit terminals installed and communicating by next February and hopes to have from 350 to 400 terminals up by the same time in 1978, Florence said.

There are two reasons for the prolonged installation process, he said. The first is monetary: "The terminals are expensive units" considering how many the chain is installing.

Secondly, "it's a matter of logistics. We've instituted a POS field manager to train employees – We don't want to flood the restaurant sites without adequate training," he said.

Six Months Planning

Six months of work went into the planning of the network, in an effort to "close the entire circle" of restaurants, Ponderosa's meat plant and corporate headquarters.

"We [at headquarters] were kind of a separate entity and divisions acted on their own," Forence said, noting management lacked information at all company levels.

With the terminal network, the circle will be closed, and the business will be under the complete control of headquarters. The network also will be justified in monetary terms because of the improved controls, timely information and "all the standard reasons" for installing such a system, he explained.

Each terminal will be tied through a Wats line network to an IBM System 7 CPU here acting as a front-end processor for a 750K-byte IBM 370/145; The System 7 will have direct channel attachment to the 370/145, he added.

The terminals will be polled at night, from about 12 midnight to around 3 a.m., across three time zones in what Florence called a novel polling approach.

Polling will be done by the front-end processor through six automatic calling units – one for each Wats line – able to dial the stores without an operator, Florence said.

Bell 200 Series modems at corporate headquarters will relay the query at 1,200 bit/sec and terminals will be polled directly from core memories, Florence said.

Pioneering Method

Florence thinks Ponderosa is "a pioneer in this polling method."

Polling directly from terminal core, however, will eliminate Ponderosa's ability to access the information held there during the working day without permanently extracting it, he noted.

When the network finally goes operational in August or September, the restaurant chain will know if there are any problems. At present, no terminals have been polled, Florence said.

Once the first terminal is polled in late summer, Ponderosa will just have to add telephone numbers to the front-end machine because the network will be standardized, he said.

Florence expects the polling operation to take about 3.3 hours for 400 terminals assuming a worst-case call completion time of three minutes. In actuality, the polling process for each terminal should take about 1-1/2 minutes, he added.

Three Phases

The information polled will be handled in three phases, Florence said. First, all the restaurants' financial data and product mix information will be sent for the use of the company's marketing groups.

After that phase has been successfully implemented, payroll data will be added to the financial data.

The third phase will include accounts payable, inventory and automatic recording data sent over Ponderosa's communications facilities, Florence said.

If there are any malfunctions at the store level, he said, NCR will have to handle those problems because that end of the network is "100% NCR equipment" including a 1,200 bit/sec modem incorporated in the terminal.

While Ponderosa waits for the first terminal to be polled, the company is making use of the units at the store level, where they have helped reduce paperwork and accounting requirements, he said.

9,600 Bit/Sec Modem Available

WHEELING, Ill. – Gandalf Data Communications Ltd. has brought out the LDS 120 modem which is said to be suitable for all speeds of asynchronous data transmission up to 9,600 bit/sec on half- or full-duplex wire circuits.

The LDS 120's modulation scheme does not require DC continuity, the company said, adding transmission signal levels are in accordance with Bell Publication 43401.

At 9,600 bit/sec over 26-guage-wire, the modem will transmit data up to 5.5 miles. Other features include controlled carrier for multidrop mode of operation with separate light-emitting diodes for Power and Receive Carrier indications.

The LDS 120 costs $300, Gandalf U.S. operations spokesman said from 190 Shepard Ave., Wheeling, Ill. 60090.

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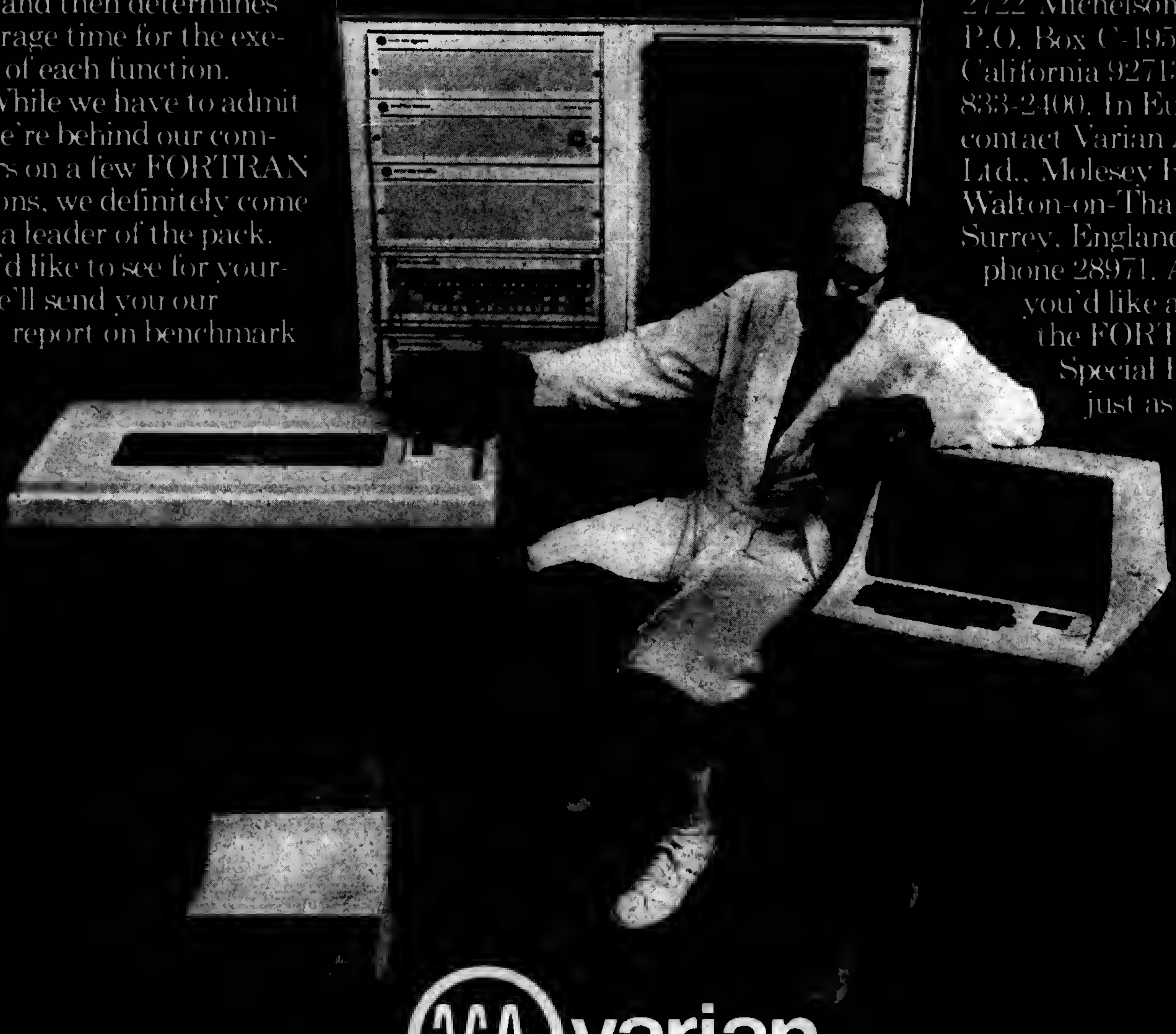

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Helping a Fast World Move Faster

Lear Siegler Upgrades ADM-1, Gives ADM-3 Full Cursor Ability

ANAHEIM, Calif. – Lear Sigler, Inc. has introduced an upgraded version of its ADM-1 terminal and made modifications to the ADM-3 terminal.

The ADM-1A, designed to simplify data entry, features an expanded solid-state keyboard with both numeric pad and lower-case Ascii alphabetic characters.

The numeric pad has a period, comma and plus and minus signs along with a 138-character keyboard that contains punctuation and control keys, a spokesman said.

The terminal's numeric pad is positioned adjacent to and immediately to the right of the standard keyboard to afford natural operator hand movement and facilitate numeric data entry, the company said.

Additional features include a display of 960 characters in a 5 by 7 dot matrix arranged in an 80-char./line by 12-line format with optional placement of 1,920 characters in 24 lines.

The basic ADM-1A is priced at $1,850 with a 30-day delivery.

ADM-3 Operation Expanded

In addition, the company has added a capability for full-screen cursor operations to facilitate modification of displayed input and output data on the ADM-3 "dumb terminal."

Augmented cursor operation of the ADM-3A includes both keyboard and direct computer control, with full range of cursor movement across the video display terminal's screen, according to the company spokesman.

This feature adds $50 to the terminal's basic $995 price, he said, adding the cursor control cannot be retrofitted to earlier models. Models equipped for full cursor control are designated ADM-3A, the company said.

The second character set has 64 Ascii characters displayed as upper case, plus punctuation and control. The keyboard mounts 59 alphanumeric keys plus teletypewriter control keys, Lear Siegler said from 714 North Brookhurst St., Anaheim, Calif. 92803.

Synchronous Modem Extends GDC LSI Line

WILTON, Conn. – General Datacomm Industries, Inc. (GDC) has added the GDC 201-7 to its line of LSI synchronous modems.

The 201-7 features 2,400 bit/sec private-line operation, Bell 201B and 201C compatibility, optional remote diagnostics for point-to-point or multipoint applications, four-wire dial backup, complete loopback capabilities and modem self-test, GDC said.

The GDC 201-7 was designed to operate over unconditioned four-wire types of private lines. Four-wire dial backup is provided for operation over the dial-up network via a pair of Bell Manual Data Couplers (CDT 1000A).

Available as a stand-alone modem for remote locations, the 201-7 incorporates diagnostic functions which permit local verification of modem and system operation without the need for special tools or test equipment, the firm said.

The unit costs $875 with delivery in 30 days from 131 Danbury Road, Wilton, Conn. 06897.

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Data Briefs

Beehive Designs Terminal For Users on Budgets

SALT LAKE CITY, Utah – Beehive Medical Electronics, Inc.'s Beehive Terminals has introduced the B100, a remote video display terminal designed to accommodate users with budgetary limitations.

The B100 is self-contained, operator/computer accessible terminal featuring switch-selectable transmission rates from 110 bit/sec to 19.2 kbit/sec, cursor control, RS-232C or current loop interface, addressable cursor, erase mode and a hard-copy capability with printer interface.

Expansion options, such as formatting, editing, blink and 16 function keys, are available, Beehive said..

The terminal employs a 12-in., digital-type monitor which is formatted to display 12 or optional 24 lines with 80 char./line. Upper- and lower-case characters are optional.

The B100, which has a total page memory of 960 characters or optional 1,920 characters, costs $1,495. Beehive is at 870 W. 2600 South, Box 25668, Salt Lake City, Utah 84125.

Unit Offers Dial-Up, TWX

SANTA ANA, Calif. – Info Products International (IPI) has introduced the Quad/Mode data communications terminal with both dial-up and TWX capability and four transmission modes.

The terminal is based on a modified General Electric Corp. Terminet 30 teleprinter, the company said.

The Quad/Mode has dial-up capability for time-sharing terminals through Direct Distance Dial (DDD) telephone lines at switch-selectable transmission speeds of 10-, 20- or 30 char./sec; access to the TWX network; direct hookup for a local computer communications front end; and an alternate model access to the TWX/DDD networks through a special modem with an RS-232C interface, IPI said.

The unit is also said to offer 80 or 132 print positions, single or dual magnetic tape cassettes, 1,200 bit/sec transmission, automatic answering and originate/answer capabilities and rotary or Touch-Tone dialing.

The Quad/Mode terminal carries a purchase price of $2,509; the Quad/Mode TWX/DDD modem may be purchased separately for use with other terminals, IPI said from Suite 1, 1241 E. Chestnut St., Santa Ana, Calif. 92701.

NCR Adds Modular Matrix Printer

DAYTON, Ohio – A modular matrix line printer designed to operate in a variety of communications environments has been announced by NCR Corp.

The NCR 6440 offers a variety of interface kits and options, NCR said. This reportedly allows users wide latitude in tailoring a remote, multicopy printer to their specific needs.

The tabletop printer can print an original plus one to four copies at a speed of 173 char./sec. Designed for use with NCR Century mainframes and minicomputers in a communications environment, the printer can also be used as a "slave" printer with the NCR 796 visual display terminal or as a stand-alone remote or in-house unit, NCR said.

Purchase price for the printer is $2,575. Monthly rental is $90. Purchase prices for the eight interface kits range from $825 to $3,175; equivalent rental prices range from $30/mo to $105/mo.

The printer will be available for customer delivery in the fourth quarter, NCR said.

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Decision Made on Three Criteria

NCSS Puts Amdahl 470 on IBM 370-Based Network

By Toni Wiseman
Of the CW Staff

STAMFORD, Conn. – There were three primary criteria which proved positive and encouraged National CSS, Inc. (NCSS) to add an Amdahl Corp. 470V/6 to its network – price/performance, diagnostic abilities and ease of installation.

At the time the decision was made to acquire a new computer, NCSS East Coast data center had an IBM 370/158 and a 370/168, and it was running out of capacity faster than expected because of an extremely good business year, according to Michael S. Field, vice-president of data systems for NCSS.

Its options were to add another 370/158 or to upgrade the 370/158 it had to either a 370/168 or an Amdahl system, he said.

"We'd been looking at Amdahl for about 12 months. We'd done some benchmarks in its Sunnyvale center and had some conversations with [the University of] Michigan and spoken to others about their experience, primarily Mass. Mutual Life Insurance Co.," Field said.

"As a result of our findings it seemed like [the acquisition of the Amdahl machine] was a reasonable business decision for us to make in terms of the kinds of improvement we expected to see within the 1.5 to 1.6 range, or 50% to 60% more throughput," he said.

NCSS has its own operating system, VP/CSS, which is of the same parentage as VM, Field said. It consists of two parts – the virtual control program or VP and its conversational software system or CSS.

VP is a 'virtual machine' control program that shares the resources of the hardware system among the tasks running on the system, which may involve time-sharing information, retrieval, batch processing, and other operating systems or remote batch.

Ran Benchmarks

At Sunnyvale, NCSS ran benchmarks where it "fired up more and more users to see how the system handled itself and measured its throughput," Field said.

Since the only machine available for tests was a 2M-byte system, it was forced to run a number of tests, extrapolate the results and project what the results would be with a full configuration.

"We're looking at a 6M-byte system when fully configured," Field said. "That's what we feel is a good balance for our operating system, between the memory size and the CPU power."

NCSS can run up to 250 users simultaneously on its 370/168. Based on the benchmarks, it feels the Amdahl machine should accommodate "50% as many as the 168, conservatively in the 350-plus area," he said.

Remarking on the three primary criteria which led to the selection of the 470V/6, Field said NCSS expected to achieve somewhere approaching a 2:1 ratio in terms of price/performance over the 370/168, where the cost of the Amdahl system was approximately 20% less than the 168, and the projected performance was 60% more.

"Even if we were being optimistic and 2:1 is better than we're going to get, even approaching that number is attractive to us," he said.

The 470V/6 costs in excess of $4.25 million, of which approximately 75% will be on a long-term debt basis and the balance paid from general funds.

Field also praised Amdahl's diagnostic abilities which, he said, were necessary for their time-sharing applications.

In addition, the Amdahl machine was slated for installation in a new facility.

"It would have been quite expensive in terms of fitting it up for cool water for the 168," he said, "but the Amdahl is air cooled and doesn't need it."

"It's also a more easily maneuverable and installable machine. The thing was installed in 12 hours compared with one to two weeks for a 168," he said.

"We didn't speak to anyone who had any reservations about their [Amdahl] system," Field said.

"I think Michigan did have a couple of problems right at the beginning, a channel problem which bugged them for a while. But that was the only negative comment we heard, and people at Michigan spoke about it in a positive way because they were impressed by the way Amdahl handled it," he said.

NCSS took the 470V/6 for an acceptance test in May and "submitted it to as many different loads and as heavy a load as we possibly could to exercise it both from the performance and reliability standpoints, just to see if it met our expectations," Field said.

The results were so satisfactory NCSS moved up the date for putting its customers on the system from June 15 to June 1.

"For the first two weeks we didn't see one hardware hit during prime time, which was remarkable for a new machine," Field said, "and since that time we've had maybe one or two hits, but nothing dramatic."

NCSS is not worried about Amdahl's viability as a hardware manufacturer, although it was an important consideration at one time, Field said.

In addition, NCSS, as well as others, have a backup agreement with the Fujitsu organization, in the event Amdahl itself could not provide maintenance services, he noted.

Auditor's Ante in DP Systems Seen High

By Don Leavitt
Of the CW Staff

MONTREAL – The widespread use of computers for processing accounting and other business information has had a "significant impact" on the specific measures used to achieve adequate control, according to Paul R. Smail, manager in the headquarters organization of Arthur Andersen & Co.'s Administrative Services Division.

Addressing a technical session at the recent Common meeting here, Smail noted, however, that "basic elements that must exist" in an adequate system of internal control are unaffected by the DP method used.

Those elements include a plan of organization which provides appropriate segregation of functional responsibilities and a system of authorization and record procedures adequate to provide reasonable accounting control over assets, liabilities, revenues and expenses, he said.

But sound practices to be followed in the performence of duties and responsibilities of each department, and personnel of a quality commensurate with their responsibilities, are also among those basic elements, Smail stressed.

Compensating Controls Needed

With computers, "new controls are necessary" since "many functions which were formerly dispersed throughout several departments are now performed by people and machines in a single department," Smail said.

This means, he went on, many control measures which are based on human judgment or division of duties simply are no longer available. Without compensating controls, the auditor considers the computer a "device that lets us process data, in an erroneous manner, without human intervention, at the speed of light."

Specifically, Smail said, the auditor may be stymied because "in most situations the computer plays a major role in compiling the account balances he is auditing." Beyond that, "much of the detail backing up these balances is on computer files, readable only through the eyes of the computer,"

In addition, "this data is basically manipulated by the computer with no permanent record of what was done, and the logic of the processing itself is essentially invisible to the auditor," he continued.

"You can appreciate that this is a sobering prospect for a man who puts his professional reputation, his livelihood and his personal assets on the line when he says the financial statements produced by this process 'present fairly' [the company's financial position]," he added.

On the other hand, he went on more optimistically, "the speed of the computer and it ability to perform logical and arithmetical operations present significant possibilities, not practical in a manual system, for providing better internal control."

Auditor's Expectations

Since the auditor sees both good and bad arising from heavy use of a computer, there are several things he would like to find in his review of internal controls in a DP system, Smail said,

If a company looks to the auditor only for his opinion on financial statements, the review will probably be limited to those controls which ensure the accuracy of the ledgers, reports and other products of the system.

In that case, Smail said, the auditor will want to know what controls exist to ensure that all transactions are properly recorded on source documents, that all source documents are transmitted to the data center and that the transcription of the documents to machine-readable language is done accurately.

All transactions should be entered into the computer system, but only once; the transactions must be processed properly through the various programs that make up the DP system; and the ledgers, reports and other output must be properly prepared, Smail added.

Even if the auditor's role is defined that narrowly, the speaker continued, the auditor will have to acquire a certain background to increase his understanding of the process. He will have to know, for example, the type of equipment used, the organization of the systems development and operations functions and the degree of involvement of the company's own internal auditors in developing and testing system controls.

If the company's management takes a broader view of the auditor's responsibilities, Smail said, his review of controls will also be broadened to include those measures in effect to prevent improper use of the system and to ensure its continued availability in an unimpaired condition.

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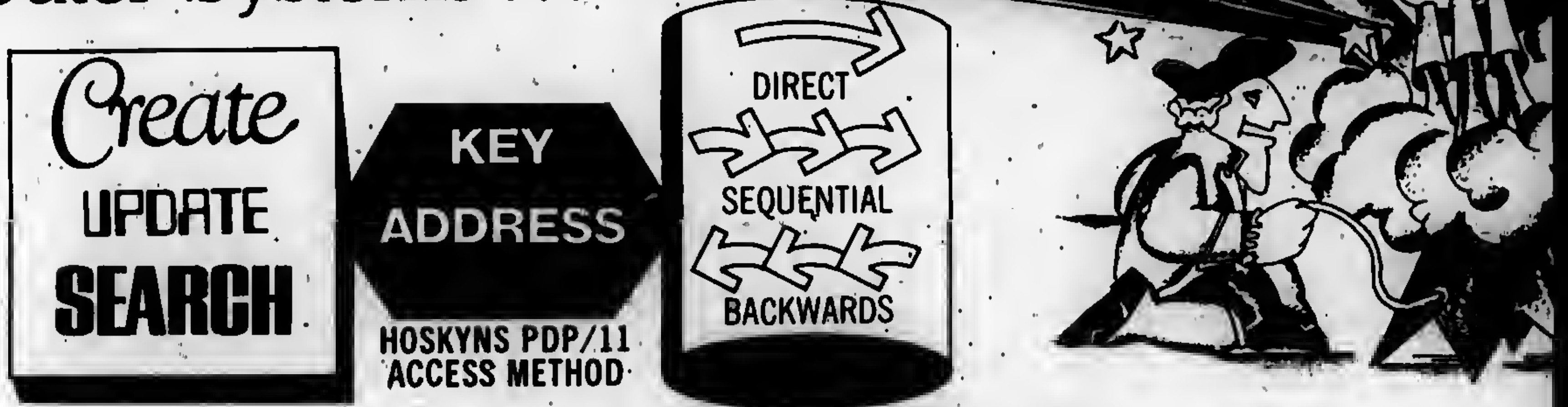

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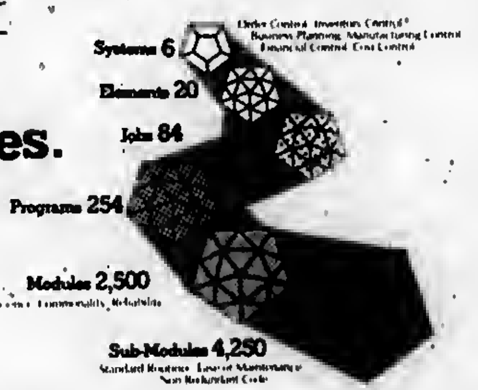

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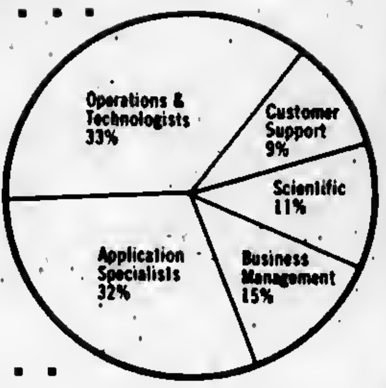

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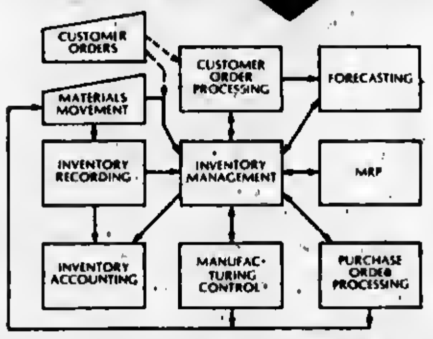

MAS offers meticulous fit, immaculate finish and demonstrable performance at miniscule cost. If that's not enough, MAS allows you to build a **totally integrated system**: piece by piece, in any sequence, with the certainty that it will all fit together. Take the MAS Inventory Control links.

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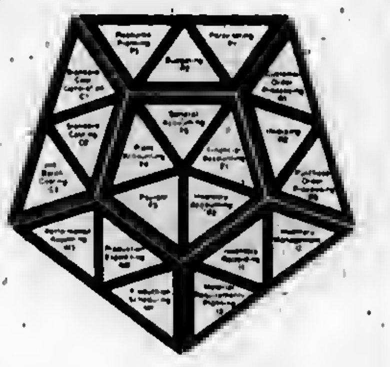
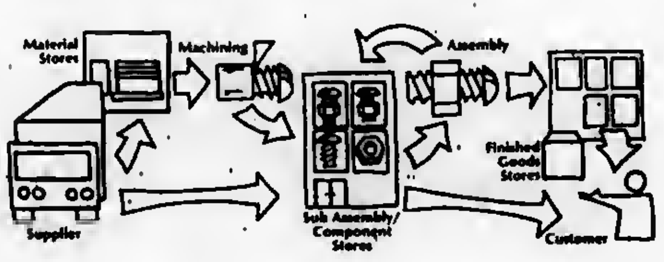


Tailored Fit . . .

Where MAS can be used, you get a system to your exact specification with a finish better than custom. Only by spreading the cost of detailing over many users can such refinement be afforded. And **MAS fits better than custom**. Take inventory control as an example. MAS models the complete inventory situation: resources and movements. Because it accurately reflects the real situation, it can always be tailored to fit individual requirements. And, because it's built to flex, MAS continues to fit your developing needs:



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With COBOL code averaging $6 to $10 per line, MAS costs less than $1 per immaculate statement—standard. **Tailored to include special facilities**, it isn't likely to reach $2 per line. The $6/$10 norm? As follows:

	High	High	Low	Low
Cost/ Man Month*	$2.400	$4,000	$1,440	$2,400
Statements/ Man Month	240	400	240	400
$'s/ Line	$ 10	$ 10	$ 6	$ 6

*Includes Fringes Training Machine Time

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Over 550 MAS systems are now in use—worldwide. You can see them working, study the documentation and **see the results produced**. So you know that there's no risk and the performance is proven. And you'll appreciate the refinement that comes with experience. For example, the MAS Inventory Control System provides a complete spectrum of inventory policies.

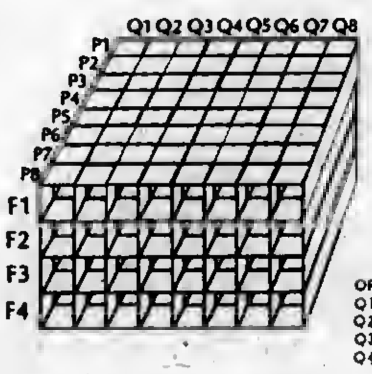
ORDER POINT

P1	Calculated From Service Level
P2	Calculated From Safety Factor
P3	Calculated From Safety Period
P4	Out Of Stock
P5	Back Order
P6	Fixed Quantity
P7	Individual Period
P8	Intermittent Period

FORECASTING

F1	Single Level Exponential
F2	Exponential Plus Trend Correction
F3	Statistical Plus Management Supplements
F4	Manual

Note: All of above may be order or usage based; and include consistency and responsiveness checking.



ORDER QUANTITY

Q1	Economic Batch Quantity	Q5	Jobbing Orders
Q2	Part Period Balancing	Q6	Discrete Period Cover
Q3	Discrete Orders	Q7	Multiple Period Cover
Q4	Fixed Quantity	Q8	Replenishment

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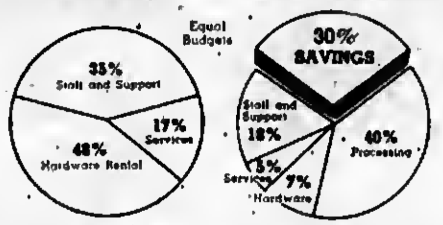
Example of in-house versus remote job entry computing costs.



Most of our clients operate through Remote Job Entry (RJE) terminals installed in their offices. They get all the **convenience, responsiveness and control** of an in-house computer. Card readers, videos and printers (and, maybe local storage and processing power) are handled just as you would an in-house machine. Economy of scale and utilization makes for significant savings.

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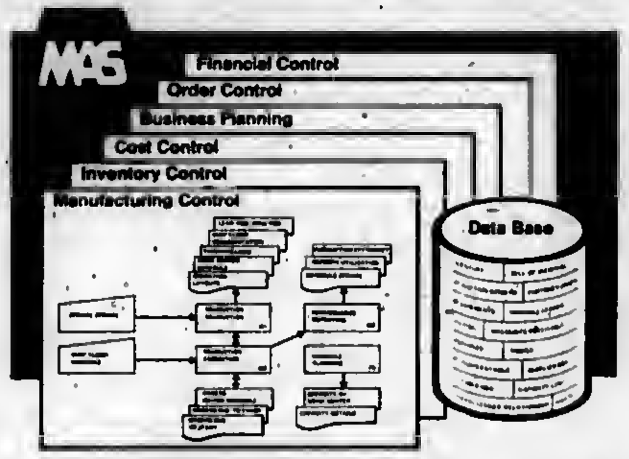

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SECURITY	
FIELD	**FUNCTION**
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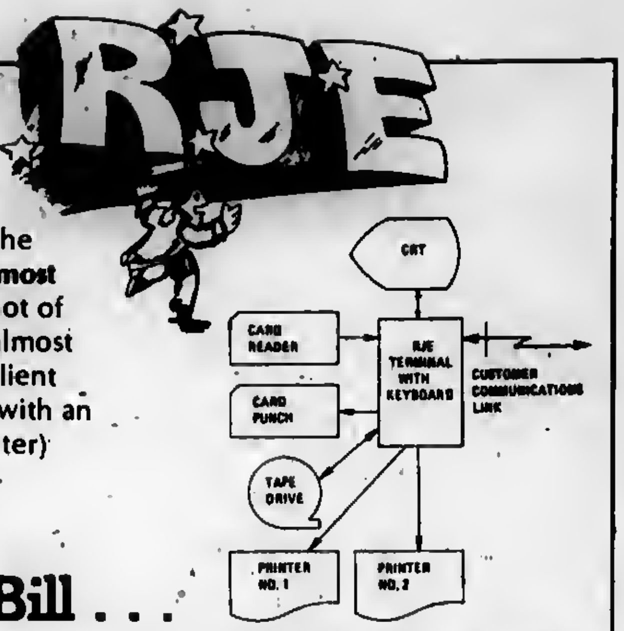
Account #	Protection hierarchy
Accounting I.D.	Cost control
Location	Protection hierarchy

PRIORITY	
CLASS	**TIME INTO EXECUTION**
I	Interactive
Q	0 minutes-15 minutes
O	15 minutes-1 hour
J	1 hour-4 hours.
K	4 hours-12 hours

The Elastic Configuration . . .



If you use an RJE facility, the most noticeable feature is the **almost limitless** power. The /168's do a lot of work in a hurry; and they have almost any capability you'd want. This client replaced an in-house computer with an RJE set-up (adding a second printer) while saving money.

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EQUIPMENT NO. JOBS/WK	360/50 2000	DATA 100 3000
NO. OPERATION SHIFTS	3/DAY, 7 DAYS/WK	2/DAY, 5 DAYS/WK
NO. DAYS TO CLOSE MONTH END	5	2
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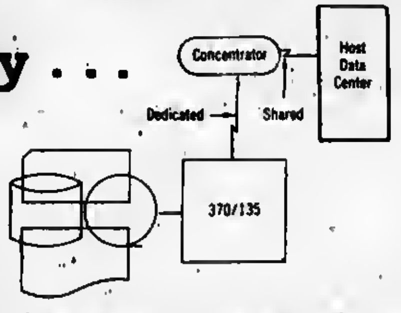

With RJE you get limitless capacity, remarkable savings and state-of-the-art technology. So you're always **right up to date**. You avoid the inertia, the heavy system maintenance burden and the underutilization cost of your own facility. You get the benefit of the super configuration and powerful software. And you can mix-and-match economic local facilities with the central /168 resource (for peak loads, large jobs or special software work).

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Pilot System Controls German Traffic By Changing Signs Where Roads Meet

RUSSELSHEIM, W. Germany – Heavy traffic flows along the highway network between Frankfurt, Wiesbaden and Darmstadt, which serves arterial highways from Cologne, Hanover, Munich, Stuttgart and Basle.

Not so unusual – except that a computerized traffic control system has been experimentally implemented for the first time along these supraregional highway routes.

Current traffic situation is shown on wall-size mimic diagram which also indicates the present state of the relief-route signs installed at highway interchanges.

In accordance with Germany's Federal Ministry of Transport, a trial system was set up there to interpret current traffic volume data and operate variable relief-route signs at highway interchanges.

The relief-route signs are changed when a Siemens AG Model 16030 traffic control computer located here finds certain sections of the highway are carrying unequal traffic volumes.

The sign system enables traffic streams to be diverted at two four-way interchanges, Darmstadter Kreuz and Nordwestkreuz Frankfurt, and two three-way interchanges, Russelsheimer Dreieck and Monchhof-Dreieck, to alternative relief routes.

The traffic control system essentially consists of variable relief-route signs posted at highway interchanges, special detectors for the collection of current traffic data, a transmission system and a control center with the Siemens computer.

Detectors embedded in the roadway pavement report to the control center the numbers of vehicles on the road, their speed and whether the vehicles are passenger cars or trucks.

Discriminating between vehicle categories is important in those cases where highway traffic is to be diverted to routes containing uphill gradients.

In the Russelheim highway maintenance depot control center, the computer processes the traffic data and displays it in consolidated form on a video display unit and on a mimic diagram.

When sections of a highway are reported to be carrying excessive traffic volumes, a traffic rerouting program is initiated by changing the variable relief-route signs at the interchanges.

The signs are set up along the highway in sets of two advance signs and one main sign. The signs in a set are not changed simultaneously but consecutively, depending on the average vehicular speed prevailing on the respective section of highway.

This minimizes the number of motorists receiving contradictory rerouting recommendations.

Variable relief-route sign is changed after CPU determines necessity of rerouting motorists.

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In-House System Gives City Assessors Local Control

PONTIAC, Mich. – An in-house system here is giving this city local control over property assessments.

"Our assessors felt local control was important," Robert D. Chapp, acting management systems administrator for the city, said.

"They didn't believe the assessed value of a piece of property in Pontiac should be under the control of an individual in the county government who might live 40 miles away."

The software system used by Pontiac computes and prints tax bills, assessment rolls, tax rolls, three-year sales studies and has a loss and adjust subsystem.

Initially developed by Oakland County, the system is available to any government body, he said.

The Pontiac DP department is equipped with an NCR Century 200 with 64K, two NCR 657 disk drives, an NCR 686 card reader, five NCR 736 key-to-tape units, three phase-mode tape handlers and a 1,500 line/min printer.

The use of three-year sales studies is a key element in equitable property assessment, according to Chapp.

"We're not interested in the selling price of an individual house," he said. "For example, a few sellers in a neighborhood might get lucky and sell their homes at the highest possible price. That doesn't mean property taxes should be raised for the whole subdivision."

Deeds filed with the county supply the sales information for the computerized three-year sales report which provides market price by subdivision, sales averages and other data.

The percentage of difference between the selling price and appraised value is computed. Large percentage differences in particular subdivisions will trigger close scrutinization by the assessor's office prior to the next tax season.

In the Pontiac system, a loss and adjust file is used to keep track of new construction or changes in structure such as building improvements. Resulting changes in assessment along with the reason coded in are reported in one listing.

A by-product of the loss and adjust system is the Change of Assessment Notification which is automatically printed. This letter informs the taxpayer of the amount of any change, the reason for the change and the time and place set by what's happened in regard to the assessment roll also are prepared and sent to the state.

The tape generated during operation of the loss and adjustment system is fed through Pontiac's maintenance system to update the property tax master file.

Following this update, the assessment roll is run. It lists property by subdivision, showing owner's name, mailing address, legal description of the property, mortgage, zoning and use codes and assessed valuation. Once this assessment roll is approved and the tax rate has been set, the tax roll may be printed.

In addition to the information on the assessment roll, the tax roll lists taxes by category and computes the city's 1% collection fee.

Of course, what the taxpayer sees is the actual bill. Printing of the tax bills is the most time-consuming operation for the Pontiac DP department, taking about 12 hours because of the number of necessary form changes.

At the time the bills are run, an accounts receivable file is created. As property owners pay their taxes through the City Treasury, the accounts receivable file is updated. The treasury has its own NCR 41 paper tape unit. At day's end, all paper tapes are input through a translation program using the NCR 736 key-to-tape unit.

The system rejects over- and underpayments. Partial payments will be accepted only if specially keyed.

Pontiac collects taxes for both the city and the county. However, it does not collect delinquent taxes. Each March, the delinquent tax role which adds penalties into the tax totals is sold to the county for collection.

Pontiac has two tax seasons: city tax bills are issued in July; county tax bills are prepared in December. Of course, Pontiac's system has a number of other capabilities including creation of personal property tax bills with depreciation figured in; yearly reports which summarize all new tax data by subdivision, bank code, zone and land use; and reports on cash received.

Citibank Gets Nonstop

CUPERTINO, Calif. – The first Tandem 16 Nonstop system has been delivered to Citibank in New York City, according to its vendor, Tandem Computers, Inc.

The system will be evaluated in a number of banking applications, the firm said.

The configuration includes two 16-bit processors with 128K bytes of core each, a 10M-byte disk with controller, 45 in./sec tape drive with controller, multiplexer, operator console, two CRT terminals and a line printer. The system cost $98,300.

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Mini Bits

HP Adds 9830B Calculator, Reduces Price of 9830A

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) has introduced another model in its 9830 series of programmable calculators, reduced 9830A prices and added options to the 9830A.

The 9830B uses semiconductor memory recently developed for the HP 9825 calculator and comes with 15,808 bytes of read/write memory, built-in string variables and matrix operation capability, the firm said.

The basic 9830B costs $8,350; the system can be expanded to a total of 30,144 bytes for an additional $3,200.

HP also reduced the price of a standard 9830A with 3,520 bytes of memory to $4,900 from $6,800, a spokesman said.

Options to allow the user to completely replace the 9830A's memory and increase its memory to that of the 9830B were also announced by the firm at 1501 Page Mill Road, Palo Alto, Calif. 94304.

TI Puts 990 Micros on Rental

HOUSTON – Texas Instruments, Inc. (TI) has announced rental plans for its TI 990 microcomputer systems.

Systems available for rental are the Model 990/9900 prototyping system, Model 990/4 software development system and the Model 990/10.

The plan allows for 30-day cancellation privileges after a minimum 90-day period and includes conversion to sale provisions, TI said.

The 990/9900 prototyping system rents for $570/mo, the 990/4 for $642/mo and the disk-based 990/10 for $1,911/mo including installation and monthly maintenance. TI is at P.O. Box 1444, Houston, Texas 77001.

Workshop on Minis, Government

WASHINGTON, D.C. – A workshop on minicomputers in state and local government data processing will be held in Atlanta Aug. 27-29.

The workshop is cosponsored by the Special Interest Group on Minicomputer Technology of the Urban and Regional Information Systems Association and by the International City Management Association (ICMA).

Including sessions for management-level state and local government officials, the workshop is also aimed at DP technicians and people with small- and medium-sized organizations.

Registration fee is $125. Additional information is available from O. Martin Anochie, ICMA, 1140 Connecticut Ave. N.W., Washington, D.C. 20036.

Bank Saving $1.4 Million/Year

Minis Replace 370 for Stock Transfers

NEW YORK – With decentralization a corporate goal, Citibank here has installed eight high-performance minicomputers to perform stock transfers formerly done on an IBM 370/165.

Cost savings and improved access to resources were the two major reasons that the four divisions of the bank that handle this task went to minicomputers, according to John L. Hughes, vice-president of DP for Citibank's Securities and Government Services Group.

Hughes estimated the bank will realize cost savings of $1.4 million per year after an initial start-up expense of $750,000.

"Our use of Citibank's Central Data Center costs $2.8 million annually," he explained. "We are cutting that in half with lower cost hardware and software, fewer people and reduced operating expenses."

The eight stand-alone systems, which cost Citibank about $2.4 million, are being used in the four divisions, or "channels," at the bank.

Each channel has two of the configurations, Hughes said, and each configuration consists of an Interdata 8/32 Megamini with 524K bytes of main memory, three 300M-byte disks, two 75- and four 45 in./sec tape drives, two 600 line/min printers and approximately 20 local and remote CRTs.

The systems run Interdata's OS/32MT multitasking operating system. Cobol is used for the applications software; special terminal management and data base management software has also been implemented on the system.

Citibank selected Interdata after a review of several small systems, including a Digital Equipment Corp. PDP-11/70, Eclipse 3000 from Data General Corp. and the General Automation, Inc. SPC-16/440, Hughes said.

The Interdata mini was selected because its commercial software and architecture are similar with IBM's, Hughes said.

"IBM and Interdata hardware performance specifications are very similar," he said. "In fact, Interdata was the closest thing in the mini world to IBM.

"With the decentralized small computers, we have access to 4M bytes of high-speed mainframe memory compared with our 20% share of the 3M bytes on the IBM units."

Gives Channel Managers Control

Explaining how the minis will improve access to resources, Hughes said "each channel manager will have control over his entire operations with the decentralized DP operation.

"And," he added, "we have designed the systems to make our tasks less labor-intensive."

Using the minis for people savings is also effective, Hughes said. "We can combine the resources of the hierarchy managers and the controlling schedulers required in a centralized operation.

"The operations staff, which makes up about one-third of the people costs, can easily adapt to operating the decentralized systems," he added.

"The operators prefer the smaller systems because they enjoy seeing their tasks scheduled and completed rather than disappearing into a central computer and then reappearing some time later," he said.

Firm's Mission Accomplished After Gaining Processing Control

By Esther Surden
Of the CW Staff

FULLERTON, Calif. – The Mission Aviation Fellowship here switched from a service bureau to an in-house turnkey minicomputer for greater stability and more control of its processing load, according to Paul Fogal, director of finance for the firm.

The company, which supplies specialized services to national churches and mission organizations, decided to go with a minicomputer last year after running its applications on service bureau equipment since 1971.

When the service bureau went bankrupt, the firm was pressed into a "crisis decision," Fogal recalled. In a quick look at minicomputer equipment, the firm considered Hewlett-Packard, Digital Equipment Corp. and General Automation; it chose General Automation because "of its proximity" to the firm.

Donor Automation, Inc., a Redlands (Calif.) systems house, provided the minicomputer with all software, Fogal said.

Applications running on the system include a donor accounting system, which keeps track of tax-deductible contributions and provides donors with receipts for the Internal Revenue Service. The system also keeps tabs on the types of direct mail that cause a donor to respond so future mailings can be scientifically selected, Fogal said.

Customizes Mailings

Computer letters in quantities as few as 50 can be generated economically by the system, Fogal said. Most service bureaus, he noted, will not attempt a mailing of less than 10,000 pieces.

Mission likes the ability it has to customize letters on a very selective basis, determined by narrow criteria such as locality and donation history, he noted. The letters are generated on a 200 line/min upper- and lower-case printer.

One of the system's important benefits, he noted is that it has eliminated time-consuming lookup, correction and resubmission of data.

(Continued on Page 25)

Turnkeys Work With Newspapers

MELBOURNE, Fla. – Two large-capacity, minicomputer-based processors, the models 2560 and 2570, have been added to Harris Corp.'s 2500 copy-processing line.

The turnkey systems are based on Digital Equipment Corp. PDP-11 minis, a spokesman added.

The Model 2560 is a dual-processor system with a large data base for editorial, wire, classified and display copy which can handle up to 96 editing and input terminals and associated peripheral devices, Harris said.

Its dual-processor configuration assures 100% backup for all copy in process, the firm claimed. A Model 2560 can be priced from $700,000.

The Model 2570 features a dual-processor controller linked to smaller processors which control simultaneous access by more than 380 terminals. It is priced from about $1 million to over $3 million.

Enhancements to the Model 2520 give it additional power at lower cost to serve a broader sector of the small- to medium-sized daily newspaper market, Harris said, while the Model 2550 has been modified to perform more advanced editing, data storage and copy-processing control functions for medium-size dailies.

Pricing for the Model 2520 ranges from $105,000 to over $250,000 and includes basic hardware, systems software and on-site vendor support. Pricing for the Model 2550 begins at $190,000.

All four processors accommodate disk storage subsystems also introduced. The subsystems, range from 66M characters to 264M characters.

Harris is at P.O. Box 2080, Melbourne, Fla. 32901.

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Motorcycle Dealer Gears System to Inventory Control

HUMBLE, Texas – A small business system dedicated to inventory control has allowed a motorcycle dealer here to cut his inventory investment in half and boost his profits by some 20%, he said.

"Eighty percent of our profits come from the sale of parts because of the relatively low markup on our motorcycles," Stanley Krenek, owner of Humble Yamaha, explained, "but we just couldn't keep our parts inventory up to date."

Krenek's inventory control system before he leased a minicomputer consisted of nearly 6,000 index cards, each representing a different part.

"Customers would buy parts, then we'd take those customer invoices with part numbers and try to update our records. We had a series of color-coded markers we put on the cards to show whether parts were on order, or back order or whatever," he said.

"We just couldn't keep up with the posting. We found we were typically a week behind even though we had a clerk doing nothing else for four or five hours a day. It was slow, tedious work."

"We knew we had to do something," Krenek recalled, "so we called some of the big computer companies. We were told that what we needed was time-sharing, but the costs involved didn't seem right."

I spoke to some people who had had experience with time-sharing systems and they told me about problems they had – that they could only use the system at certain times, for example, that they had been billed incorrectly in some cases and, most of all, that they didn't feel that they had control over their computing."

Stanley Krenek (standing), owner of Humble Yamaha, and Pat Miller (seated), the firm's parts manager, wrote the software programs for Humble's minicomputer system.

Krenek, who had had some experience with computers in college, decided to install a Wang 2200 system on a five-year lease/purchase contract at a cost of about $800/mo. He said he spoke to all the major mini suppliers and chose Wang because of price.

The system, which consists of a central processor and CRT console with 12K bytes of memory, a line printer and a 5M-byte disk, was installed two years ago.

Krenek and his parts manager, who had had no previous computer experience but learned to program in Basic in less than a month, programmed the minicomputer themselves.

"We wrote several programs," Krenek said. "One enabled us to enter all of our parts numbers and create a master file. We use a separate program for adding new parts numbers.

"A third program is used to update that parts list when part numbers are superceded. The original parts number remains in sequence, with a reference to the new part number. All of the original stock data we carried with the original part number is automatically transferred to the new part number.

"We wrote another program which allows us to update any of the information, new prices, for example, stored with any part number. Then we have a program which prints a 'price book' every week for our retail salesmen to use. It includes the part price and quantity in stock.

"Finally, we have a program which gives our parts manager a master printout of all the parts information we have on the system," Krenek noted, adding all of the programs he wrote are available for sale to other dealers.

Humble Yamaha's yearly sales volume is approximately $1 million and its parts sales run to nearly $125,000 annually. Krenek said Humble Yamaha's investment in parts inventory was nearly $45,000 before the minicomputer arrived.

"We began to see an improvement in our inventory within a couple of months. We increased our inventory turnover, but lowered our dollar investment by more than 15%," Krenek said.

Firm Accomplishes Mission

(Continued from Page 24)

When a letter is opened it can contain donations or mailing list changes. With the service bureau, the firm had to fill out forms to tell the bureau what to do.

If any mistakes were made, the service bureau's CPU would find them and Mission would receive an "edit" report showing the mistakes much later in the week. One of the organization's clerks would then have to research the mistakes, make corrections and resubmit the data.

Now the operators see the entry on the CRTs and, if any errors are evident, they can be corrected while the source document is still in hand, he said. Mission can also look up a contributor's past activity to make management decisions, he noted.

The hardware at Donor includes a General Automation DM-130 data management system with an SPC-16 mini with 64K bytes of core, 30M bytes of disk, two CRTs and a 200 line/min upper- and lower-case chaintrain printer.

Fogal estimated the in-house system probably "breaks even" in cost with the service bureau. However, the amount of work processed on the mini has increased since the company stopped farming out its work.

The service bureau cost Mission $1,200/mo. The in-house system cost $85,000 which, on a five-year basis, breaks down to $2,220/mo including interest paid on the loan to buy, a service contract and supplies, Fogal said.

The company is also saving the salary of one person, he added.

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A special report on Data Communications Terminals in the July 26th Computerworld.

The dollar value of the U.S. installed base of both general and special-purpose terminals should increase to $25 billion by 1980, *$20 billion of which will be shipped in the next five years,* (based on estimates by International Data Corporation, the world's largest EDP market research firm). Clearly, more users than ever before are relying on terminals to provide solutions to complex problems, while increasing the utility and accessibility of their computer systems.

Computerworld will present a special report on Data Communications Terminals in the July 26th issue, including teleprinters, CRTs and intelligent terminals. Edited by Ron Frank, this supplement will cover a variety of topics of importance to data communications users, with application stories and tutorials throughout.

For example, we'll report on how new carriers and carrier services might affect the way terminals are used. We'll look at what applications require terminals with "intelligence" - i.e., processing logic and memory - and show you some of the best ways to make use of this hardware. We'll investigate what's being done to make the terminal environment easier to use. This includes items on recent teleprocessing software enhancements and new hardware features, to name a few. In addition, we'll report on where terminals are headed, and analyze what's been happening to the cost of terminals.

If you're involved with data processing, this is one subject you may want to be very familiar with. Don't miss it. It's in the July 26th *Computerworld*. If you're a terminal manufacturer, you should advertise here. Don't miss the July 9th ad closing. Call your *Computerworld* salesman for more details. Or call Judy Milford at (617) 965-5800.

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CI Notes

J.C. Penney Adds IBM To List of POS Suppliers

NEW YORK – J.C. Penney Co. has ordered up to 6,000 point-of-sale terminals from IBM for use in its stores throughout the country.

The contract with IBM is in keeping with the company's policy of having multiple sources of supply for POS equipment, according to Robert Capone, Penney vice-president and director of systems and DP.

Penney stores also have NCR Corp. and Singer Co. equipment. To date, NCR has installed 6,500 of its NCR 280 terminals and Penney has ordered up to 17,000 of these units, an NCR spokesman said.

The order for IBM equipment does not affect NCR's long-term contractual relationship with Penney, he added.

The terminals, part of the IBM 3650 retail store system, will be located on store selling floors. They will serve both as sales registers and data entry devices and, along with the in-store controller, will provide a link to IBM 370 mainframes in Penney's regional data centers when necessary.

GSI to Market Siemens Gear

ANAHEIM, Calif. – Siemens AG's Data Processing Division and General Systems International, Inc. (GSI) have signed a cooperative marketing pact under which both companies will market specific Siemens OEM products in the U.S. and Canada.

The products include disk drives up to 500M bytes, tape drives up to 250 in./sec and MOS memories from 32K to 2M bytes as well as printer supplies.

GSI designed the data entry system Siemens makes and sells in Europe. Willi Jilke, GSI president, said he expects the pact to eventually lead to manufacture by GSI of certain Siemens products in the U.S.

Supershorts

Vadic Corp. has licensed Computer & Systems Engineering Ltd. to manufacture and distribute Vadic's low- and medium-speed CCITT and VA3400 modems.

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Tymshare, Inc. has signed an agreement with Taylorix, a West German service firm, to form a joint venture as a separately working company called Taylorix-Tymshare GmbH. The firm will provide remote computer services in West Germany.

– – –

Kennedy Co. has appointed Sintrom-Ellinor of London as its direct factory representative in the UK.

Terminal Values to Quadruple

EFT Base Seen Hitting $13 Billion in '86

By Toni Wiseman
Of the CW Staff

CAMBRIDGE, Mass. – The installed volume of equipment for electronic payment systems, including electronic funds transfer (EFT), is expected to grow in value from $5 billion this year to $13 billion in 1986, according to a study by Arthur D. Little, Inc. (ADL).

An increase from $100 million to $300 million in the annual value of related software and turnkey services during the decade from 1976 to 1986 was also projected.

But "firms wanting to be major suppliers should emphasize product or service packages or device sales to systems suppliers. Sale of individual devices or sofware products to end users should not be attempted by other than established firms," ADL cautioned.

The report, "The Outlook for Electronic Payment Systems and Related Products and Services," assessed changes and growth in the U.S. payment system environment that are significant to suppliers and users of DP equipment, software, specialized terminals and services.

The value of installed terminals for payments application's will quadruple from $1.5 billion in 1976 to more than $6 billion in 1986, according to the study.

The value of general-purpose computers supporting electronic payment systems will double in that same time frame, from the present figure of $3.5 billion to at least $7 billion, the report stated.

Some of the terminals will be general-purpose, but the greatest sales volume will be experienced by industry-tailored systems. Except for attended teller terminals, which are already selling widely, most types of terminals will not achieve maximum sales rates until 1981-84, when regulatory and market uncertainties will have diminished, ADL projected.

Law Reforms Seen

The study predicted major reforms in existing law and regulations in the next five years because of pressures from both consumers and various kinds of depository financial institutions – commercial banks, savings banks, savings and loans and credit unions.

Some of the changes forecast in the report included broadened use of off-premise electronic facilities, authorization for all depository financial institutions to offer interest-bearing demand (checking) accounts and equalization of consumer lending powers among depository financial institutions.

Continuing consumer pressures for transaction and privacy protection in electronic payment systems and for mandatory item-pricing on most supermarket goods were also seen by the study.

Such pressure may influence the direction of the electronic payments evolution, but will not prevent it, the report said.

The anticipated regulatory changes will

(Continued on Page 27)

Cbema Urges Change of Methods To Increase Trade With East

By Edith Holmes
Of the CW Staff

NEW YORK – In the interest of expanding the trade of DP equipment between Eastern and Western nations, the U.S. should give even more weight to the concept of treating each nation as a separate entity, according to Peter McCloskey, president of the Computer and Business Equipment Manufacturers Association (Cbema).

However, there are elements in the export control process working at cross-purposes, he said here recently.

"For our industry, East-West trade is really trading commercial products with separate countries with differing needs and markets. It is not really a black and white East-West issue.

"A socialist country no longer is considered a threat merely by its being socialist, nor should it be," he said.

McCloskey pointed out two problem areas in the U.S. attitude toward East-West trade: the "lack of a realistic balance between U.S. commercial and military security needs" and "the necessity for a joint government-industry understanding of what elements, factors and environment are necessary to develop sound commercial relationships with the East."

Balance of Considerations Urged

Advocating that the U.S. strike a balance between expansion of commercial relations and realistic and reasonable considerations of national security, McCloskey said "this balance must be based on consistent policy guidance that explicitly recognizes the environment and the factors critically necessary for the development of sound commercial relations and American competitiveness in the socialist markets."

In an effort to better coordinate government licensing evaluations, he suggested expanding and strengthening the roles of technical advisory committees to give them the ability to put some teeth into the changes they recommend.

While currently in existence, technical advisory committees and their recommendations have not affected either the U.S. or the informal International Coordinating Committee (Cocom), which consists of all North Atlantic Treaty Organization nations plus Japan but excluding Iceland, McCloskey said.

These committees are also not told what happens to their reports, he added, noting Cbema has recommended four-year terms for industry representatives on these committees.

Cbema has also recommended an

(Continued on Page 27)

PDP-8 Gets Own Marketing Unit

MAYNARD, Mass. – Digital Equipment Corp. has formed a single product-oriented marketing group for sales of its PDP-8 minicomputer.

The consolidated unit will provide marketing, promotion, technical support and hardware and software development. Marketing areas include industrial, laboratory, educational, engineering, computation, communications and original equipment manufacturers, a spokesman said.

"With over 30,000 PDP-8 computers installed, there is a large customer base of both end users and OEMs that require the integrated service our group can provide," according to James Willis, manager of the group.

"This concentration of effort in an integrated product line helps prevent redundancy of effort and affords new levels of development," he continued. Willis was previously responsible for PDP-8 marketing for OEMs.

The group's structure permits maintenance of a closer liaison with PDP-8 users than previously possible, he added.

Before the consolidation, the OEM group handled marketing for the large and small PDP-11s as well as the PDP-8, the spokesman said, adding most of the new group's personnel is from the OEM group.

The group will market PDP-8s from the PDP 8/A kit up to the PDP-8 systems in any market, OEM or end user, he said. However, the group will not handle the DEC Datasystem 300 series, typesetting and word-processing gear based on the 8 or the Classic, he noted.

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Cbema Urges U.S. Change Methods on East-West Trade

(Continued from Page 26)

amendment to the Export Administration Act on behalf of the computer industry that would require the government to inform the technical advisory committees of the reasons their recommendations were accepted or rejected, he stated.

A Cbema recommendation to the Senate Banking Committee which has been adopted requires technical advisory committee consultation on multilateral controls in addition to present consultation on unilateral controls, he added.

At present the only "commercial" technical representation available at the Cocom negotiations is supplied by a firm that is a defense contractor, McCloskey explained.

At the same time, he noted, representatives of the largest British computer firm sit with the British negotiators, and representatives of the largest French company sit with the French negotiators.

The Commerce Department must join the negotiating team to represent U.S. commercial interests, he urged. In addition, U.S. industry's technical advisory committees should be allowed to supply technical support and advice at the Cocom negotiations.

In the area of export licensing, McCloskey argued an exporter must have the right to know exactly why his license was denied if it is refused.

McCloskey also took issue with a recent House Appropriations Committee decision not only to deny the Office of Export Administration an expansion of resources to handle increasing licensing demands, but to cut back its resources from present levels.

On the security aspect of exporting DP equipment, he said "it is not realistic to assume the USSR or any other nation will depend upon a potential enemy to supply its computerized military computer needs that include servicing, spare parts and so on.

"Computers would have to be exported in considerable quantities and be of the very latest state-of-the-art in order to be a significant contribution to a potential enemy," he stated.

"Certainly, U.S. policies as they pertain to the export of computers are not consistent when we deny moderately advanced computers to the USSR, Eastern Europe and the People's Republic of China and, at the same time, export weapons systems containing highly sophisticated computers to nations whose long-term allegiance to the U.S. is questionable and where such technology is highly susceptible to uncontrolled leakage to what may be termed 'hostile nations,' " McCloskey said.

U.S. Policy Varies

As an example of the U.S. government's recognition "to some degree" that trade with socialist countries is not trade with a monolithic block, McCloskey said the U.S. has put a total embargo on trade with Cuba, North Korea, Vietnam and Cambodia.

Poland and Romania, however, receive most favored nation treatment by the U.S. Yugoslavia is generally treated as a Western nation, although applications for exports to it go to the Department of Defense, McCloskey continued.

Six socialist countries belong to the Western trade organization, the General Agreement on Tariffs and Trade (Gatt). "And we are all aware of the hostility between the People's Republic of China and the Soviet Union," he said.

The People's Republic of China has been given the same export control status as the USSR, McCloskey noted, but added China does not meet certain U.S. export control requirements. Accordingly, the U.S. is effectively not giving it the same treatment.

"Clearly, East-West trade in the computer area is not an uncontrolled transfer of strategic technology to a monolithic bloc," McCloskey said.

Electronic Payments Base Seen At $13 Billion in One Decade

(Continued from Page 26)

accelerate growing competition among depository financial institutions, according to ADL. With broader powers, thrift institutions will increasingly function as retail banks.

Some commercial banks, particularly those in the large, urban category, will retreat from the retail market to pursue growth opportunities in servicing thrifts and smaller banks, the report predicted.

Other banks will seek efficiencies through the use of lobby terminals, customer-bank communications terminals, minibranches and other manned but limited facilities, it said.

The market for all capabilities associated with electronic payment systems should therefore develop fairly evenly among all kinds of financial institutions involved, it added.

Preauthorized Deposits

By 1981, the existence of a national interconnection among automated clearinghouses (ACH) will help attract increasing volumes of preauthorized deposits and payments, such as Social Security and veterans' retirement, ADL predicted.

In that year, the ACHs will process an estimated 16 million federally issued payments monthly, rising to more than 40 million monthly by 1986, according to the report.

Growing volumes of automatic deposits from state and private as well as federal payrolls will generally provide a major impetus for public acceptance and usage of preauthorized transactions, it added.

Credit Card Use

Predicting that experimentation with other forms of payment technology by bankers will focus largely on point-of-sale transactions, the ADL study said credit card use will continue to proliferate over the next decade because of widespread consumer acceptance and broadened services offered by thrift institutions.

Interest-bearing transaction accounts — which combine savings, checking and open-ended credit — will begin to emerge as the preferred source of payments, it forecast.

Transaction Cards

Between 1981 and 1986, according to the timetable of the ADL report, a substantial portion of various debit, credit and check authorization cards will be replaced by transaction cards.

The transition will be slow, however, since the paper draft will continue to be the prevailing payment medium even as transaction card volume grows rapidly, ADL said.

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1. Japan will continue to increase imports of foreign-manufactured EDP equipment at the rate of 30% per year through 1977. In 1977, total Japanese DP imports will exceed $1 billion per year.
2. The U.S. share of the Japanese import market is 55%. This should remain constant, although in previous years the U.S. share has reached as high as 70%.
3. Minicomputer sales in Japan are expected to chart a phenomenal 60% annual growth rate through 1977.
4. Independent peripheral equipment purchases are expected to rise 44% in this period.

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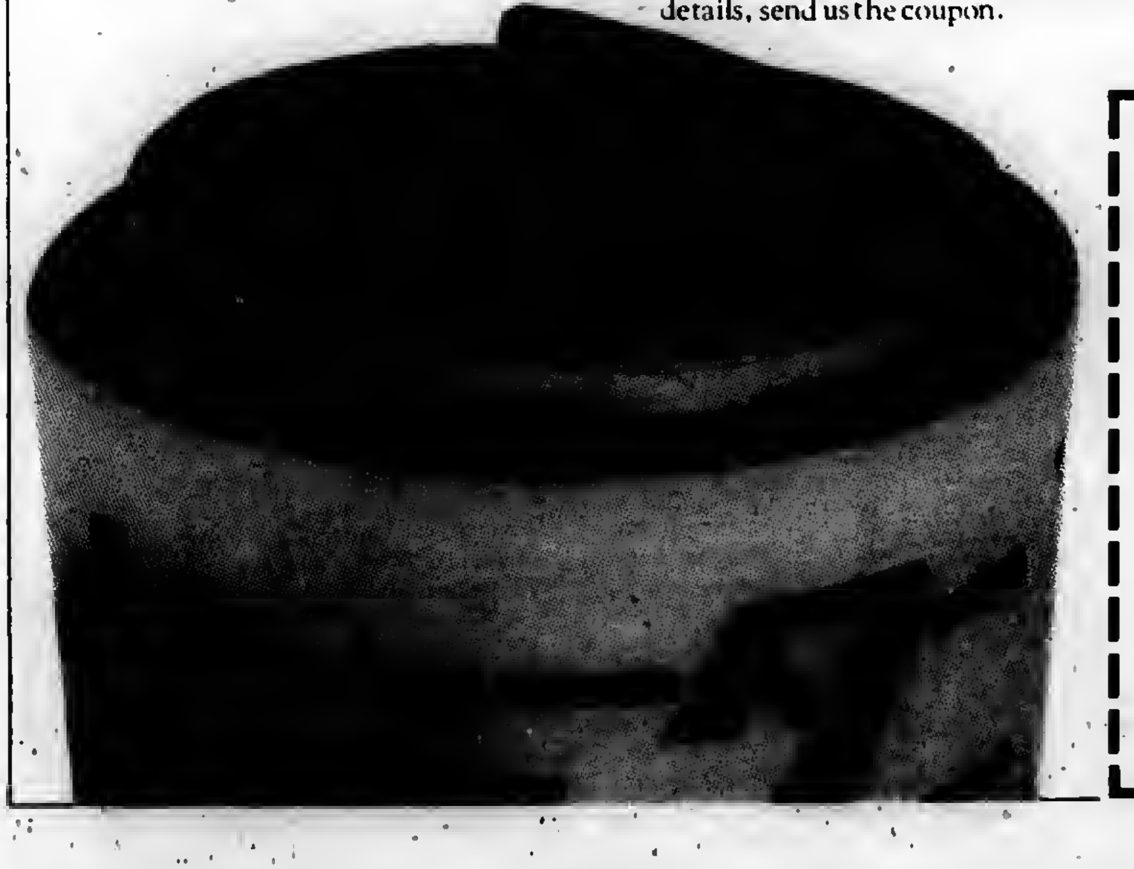

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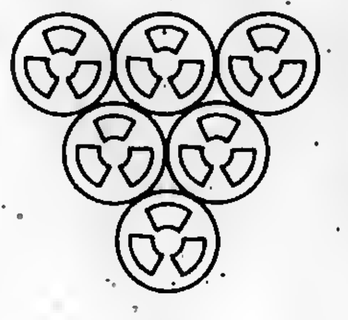

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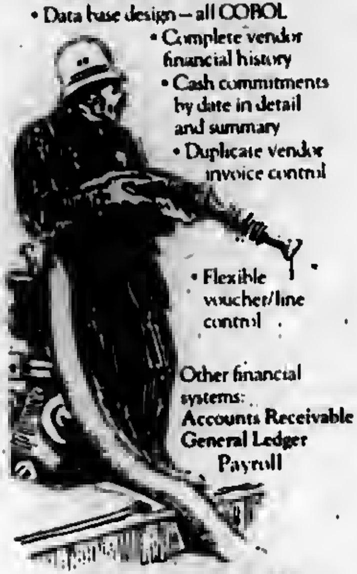

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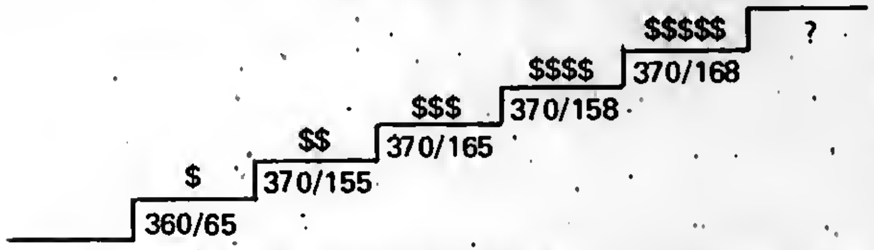

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Keydata Earnings Double, Revenues Rise in Quarter

WELLESLEY, Mass. – Keydata Corp. doubled its earnings for the third quarter on a 12% increase in revenues while posting even bigger gains in the nine months.

During the quarter, the timesharing firm's earnings reached $313,000 or 11 cents a share compared with $155,000 or 6 cents a share in the year-ago period. Tax credits were $147,000 and $74,000 respectively.

Revenues rose to $3.8 million compared with $3.4 million in the year-ago quarter.

Earnings in the nine months climbed to $794,000 or 29 cents a share including a $371,000 tax credit compared with $291,000 or 11 cents a share in the year-ago period, when there was a $135,000 credit.

Revenues rose to $11.1 million compared with $9.8 million in the year-ago nine months.

The firm has transferred its inventory of about 800 General Electric Terminet 300 terminals to Western Union Data Services, which will provide servicing for these units, according to L. Edwin Donegan Jr., Keydata president.

This arrangement will reduce the firm's long-term debt as well as result in improved customer service, he said.

Annual Earnings Drop at On-Line Despite Strong Fourth Quarter

PITTSBURGH, Pa. – On-Line Systems, Inc. finished the year with its strongest quarter of the 12 months. However, results for the year were less than those of a year ago.

The firm earned $356,251 or 42 cents a share in the fourth quarter compared with $82,599 or 10 cents a share in the same period last year.

Revenues rose to $3.7 million compared with $2.4 million in the same 1975 quarter.

During the year, earnings dropped to $816,211 or 97 cents a share compared with $1.3 million or $1.50 a share last year. Revenues rose to nearly $12 million compared with $11.4 million in 1975.

The decline in year earnings was the result of increased expenses caused by expansion of the firm's communications network, opening new offices and the newly acquired subsidiary in the UK, the firm said.

Earnings Quintuple in Nine Months As Microdata Quarter Net Up 177%

IRVINE, Calif. – Microdata Corp.'s nine-month earnings jumped fivefold while third-quarter earnings rose 177% compared with the results of the year-ago periods.

"This dramatic increase in performance reflects the company's increasing market penetration and significant gross margin improvements," according to Donald W. Fuller, On-Line president.

During the third quarter, revenues reached $8.5 million compared with $3.8 million in the 1975 period while earnings totaled $882,354 or 40 cents a share compared with $318,391 or 20 cents a share.

Nine-month earnings soared to nearly $1.9 million or $1.01 a share compared with $364,350 or 23 cents a share in the same period last year, when there was a $134,000 tax credit.

DG Results Increase At Nine Months' End

SOUTHBORO, Mass. – Data General Corp. (DG) turned in increased revenues and earnings in both the third quarter and nine months ended June 5.

In the quarter, earnings rose to $4.6 million or 48 cents a share compared with $2.9 million or 35 cents a share in the same period last year.

Revenues totaled $39.6 million compared with $24.9 million in the year-ago quarter.

During the nine months, earnings reached $12.1 million or $1.27 a share compared with $8.6 million or $1.05 a share in the same year-ago period.

Revenues rose to $102.7 million compared with $73.6 million in the 1975 period.

The firm added 1,370 employees during the nine months for a total of 4,650 and shipped 3,900 computers. The firm's plant facilities occupied 963,000 square feet as of the end of the third quarter.

...Toward the Bottom Line

Applied Digital Data Systems (Adds) has canceled its proposed offering of 800,000 shares of common. "Because of possible significant news developments, it would not serve the best interests of Adds shareholders to sell additional stock at this time," the firm said.

$ $ $

Hewlett-Packard has no plans for a stock split at the present time, President William Hewlett said in a company publication.

$ $ $

Shugart Associates has signed a $3 million revolving line of credit with Wells Fargo bank, replacing a $1 million line at a lower interest rate.

$ $ $

National Semiconductor's 1976 sales will be over $320 million and sales for fiscal 1977 will show the largest dollar gains in the firm's history, according to President Charles E. Sporck.

$ $ $

Automatic Data Processing of Clifton, N.J., has increased its dividend to 12 cents a share from 10 cents, payable July 1 to shareholders of record June 15. Shareholders have approved a two-for-one stock split.

$$$

Centronics Data Computer has declared a dividend of 10 cents a share payable July 6 to holders of record June 7.

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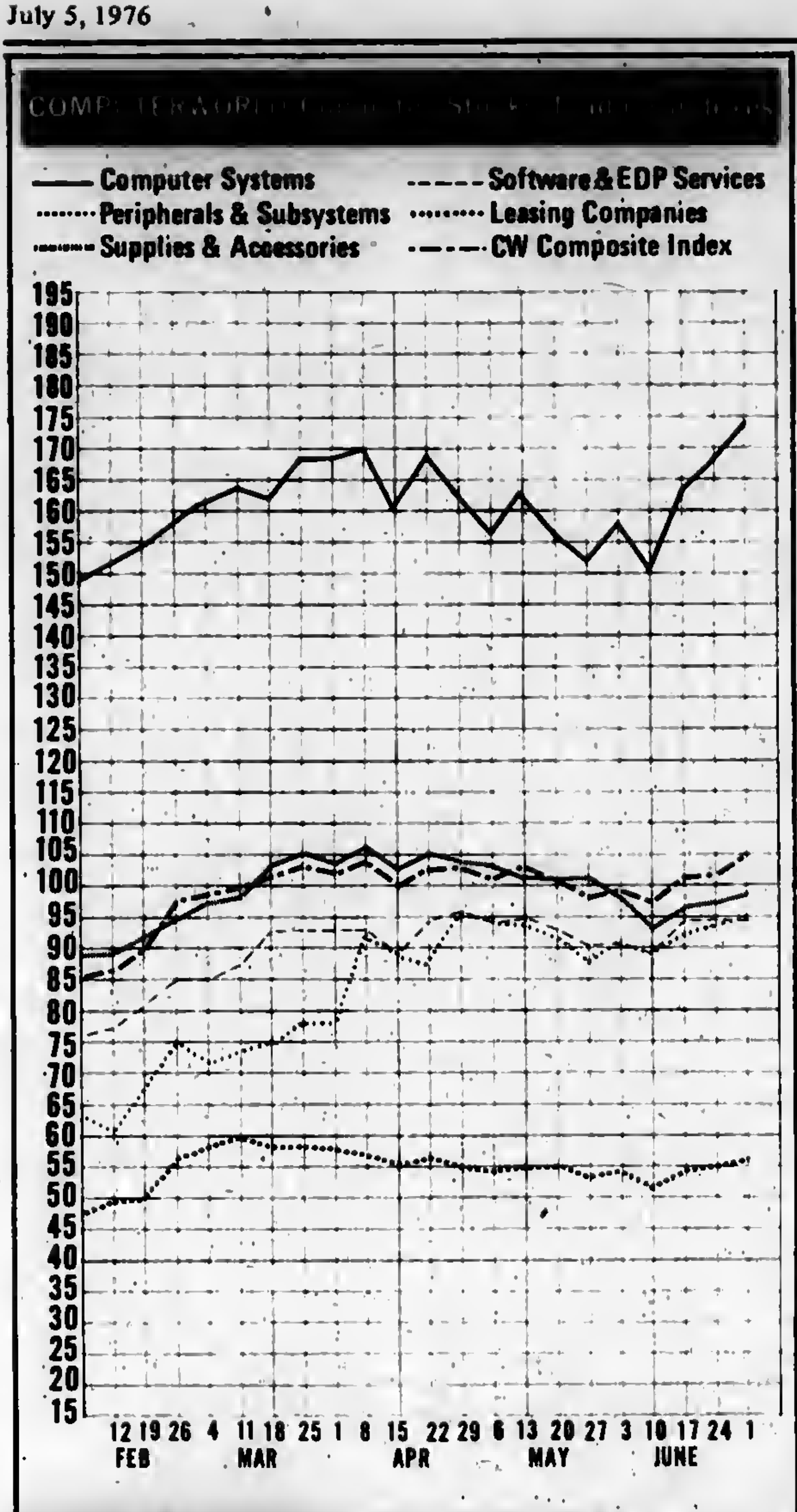

Earnings Reports

ELECTRONIC ASSOCIATES
Three Months Ended April 12

	1976	a1975
Shr Ernd	.....	$.15
Revenue	$5,504,000	7,739,000
Tax Cred	10,000	209,000
Earnings	(934,000)	403,000

a-Restatad.

ELECTRONIC DATA SYSTEMS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.26	$.30
Revenue	34,168,000	30,402,000
Earnings	3,199,000	3,708,000
9 Mo Shr	.82	.87
Ravenue	97,985,000	91,177,000
Earnings	10,070,000	10,589,000

GREYHOUND COMPUTER
Three Months Ended March 31

	1976	1975
Shr Ernd	$.08	$.01
Revenue	14,455,000	15,832,000
Earnings	356,000	49,000

MEOICAL COMPUTER SYSTEMS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.09	$.12
Ravanue	2,190,199	1,765,130
Tax Crad	.....	153,000
Earnings	244,635	325,755

NUCLEAR DATA
Yaar Ended Feb. 29

	1976	1975
Shr Ernd	.....	$1.02
Ravenua	$14,661,217	19,448,141
Tax Cred	a32,270	290,000
Earnings	14,687	941,042

a-Reflects $67,730 charge from retirement of certain debt.

SANDERS ASSOCIATES
Three Months Ended April 21

	1976	1975
Shr Ernd	$.22	$2.91
Revanue	48,343,000	48,938,000
Tax Cred	411,000	a12,956,000
Earnings	1,134,000	13,290,000
9 Mo Shr	.75	3.15
Ravenua	147,187,000	129,335,000
Tax Cred	1,141,000	a13,222,000
bEarnings	3,567,000	14,399,000

a-Includas $7.89 million credit for debenture exchanga. b-Includes $523,000 gain in 1976 and $324,000 in 1975 from sale of surplus manufacturing facilitias.

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Computerworld Stock Trading Summary

CLOSING PRICES WEONESOAY, JUNE 30, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 50 1976	WEEK NET CHNGE	WEEK PCT CNNGE
N	BURROUGHS CORP	84-108	104	+3	+2.9
O	COMPUTER AUTOMATION	10- 19	1P 7/8	+2 1/8	+12.6
N	CONTROL OATA CORP	18- 27	23 5/8	+1 1/4	+5.5
N	OATA GENERAL COMP	40- 60	54 5/8	+2	+5.8
O	OATAPOINT CORP	24- 46	44 1/4	0	0.0
O	OIGITAL COMP CONTROL	2- 7	6 3/8	0	0.0
N	OIGITAL EQUIPMENT	138-181	176 3/4	+5 1/4	+1.8
N	ELECTRONIC ASSOC.	2- 5	2 7/8	+ 1/8	+4.5
A	ELECTRONIC ENGINEER.	7- 16	12 1/4	+ 5/8	+5.1
N	FOXBORO	28- 46	44	- 1/8	-0.2
O	GENEPAL AUTOMATION	5- 11	7 1/2	+ 5/8	+5.2
O	GRI COMPUTER CORP	1- 1	1/2	- 1/8	-20.0
N	HEWLETT-PACKARO CO	95-117	114 3/4	+5 1/2	+5.1
N	HONEYWELL INC	54- 56	49 5/8	+1	+2.0
N	IBM	227-277	276 5/4	+4 5/4	+1.7
O	NANAGEMENT ASSIST	1- 5	1 7/8	0	0.0
O	MEMOREX	1P- 33	29 5/4	+ 5/8	+2.1
O	MICROOATA CORP	10- 26	24 1/4	+1 1/2	+6.5
C	MODULAR CONPUTEP SYS	9- 14	12 3/4	- 1/4	-1.9
N	NCP	24- 35	34 5/R	+2 1/4	+6.9
C	PRIMF COMPUTER INC	4- 11	10	+ 3/4	+8.1
N	PERKIN-ELMER	19- 27	23 1/2	0	0.0
N	RAYTHEON CO	45- 60	59 3/4	+ 1/4	+0.4
N	SPEPRY RAND	40- 51	51 1/4	+1	+1.9
O	SYCOR INC	20- 31	27 1/2	+ 1/2	+1.8
A	SYSTEMS ENG. LABS	6- 10	9 7/8	+1 7/8	+25.4
N	VARIAN ASSOCIATES	13- 17	15 5/8	+ 5/4	+5.0
A	WANG LABS.	11- 20	15 3/4	+1 1/4	+8.6

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE JUN 50 1976	WEEK NET CHNGE	WEEK PCT CNNGE
O	COMOISCO INC	3- 10	6 1/4	+ 1/2	+8.6
A	COMMFRCE GROUP COPP	2- 5	2 3/4	0	0.0
A	COMPUTFR INVSTRS GRP	1- 5	1 3/4	- 1/4	-12.5
N	OATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	OCL INC	1- 1	5/8	- 1/8	-16.6
N	OPF INC	5- 8	7 1/4	+1	+16.0
A	GREYHOUND COMPUTER	3- 8	7 1/2	+ 5/8	+5.2
N	ITEL	6- 14	13 3/4	+1 1/4	+10.0
N	LFASCO CORP	6- 14	13 3/4	+1 3/4	+14.5
O	LEASPAC CORP	0- 1	1/4	0	0.0
C	NMG INC	0- 1	5/8	0	0.0
A	PIONEEM TEX CORP	6- 9	7 1/2	+ 1/4	+5.4
N	U.S. LEASING	7- 12	10	+ 1/2	+5.2

EXCN: N=NEW YORK; A=AMEPICAN; P=PNIL-BALT-WASN
L=NATIONAL; M=MIOWEST; O=OVER-THE-COUNTEP
O-T-C PPICES ARE BIO PRICES AS OF 5 P.M. OR LAST BIO
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EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 50 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOVANCEO COMP TECH	1- 2	1 1/2	- 1/8	-7.6
C	ANACONP INC	9- 11	8 7/8	+ 1/8	+1.4
A	APPLIEO DATA RES.	2- 3	3 1/4	+ 5/8	+13.0
N	AUTOMATIC OATA PROC	54- 69	67 1/4	- 3/8	-0.5
O	COLENAN AMERICAN COS	3- 6	3 1/8	- 3/8	-10.7
C	CONPUTER OIMENSIONS	5- 7	4 3/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	7 1/4	- 1/4	-5.5
O	COMPUTFR HORIZONS	1- 2	2	0	0.0
C	COMPUTER NETWORK	2- 6	3 7/M	+ 1/4	+6.8
N	COMPUTER SCIENCES	4- P	7	+ 7/8	+14.2
C	COMPUTER TASK GROUP	1- 1	1 1/4	- 1/8	-9.0
O	COMPUTER USAGE	5- 6	5 1/2	0	0.0
C	COMSHARF	2- 9	7 1/4	- 5/4	-9.5
O	OATA OIMENSIONS INC	2- 4	3 1/2	- 1/8	-5.4
O	OATATAB	1- 1	1	0	0.0
N	ELECTRONIC OATA SYS.	12- 16	12 3/8	+ 1/8	+1.0
C	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 5/8	- 1/4	-15.5
C	IPS COMPUTER MARKET.	1- 2	1	- 1/8	-11.1
O	KEANE ASSOCIATES	2- 4	5	0	0.0
O	KEYDATA CORP	3- 5	2 5/P	- 1/8	-4.5
O	LOGICON	4- 4	3 5/4	0	0.0
A	MANAGEMENT OATA	1- 5	2 1/8	+ 1/8	+6.2
A	NATIONAL CSS INC	13- 25	22 1/4	+1 5/8	+6.5
A	ON LINE SYSTEMS INC	18- 22	18	+ 3/8	+2.1
N	PLANNING RESEARCN	3- 5	5 3/4	+ 5/8	+20.0
O	PROGRAMMING S SYS	1- 1	1/2	0	0.0
O	RAPIOATA INC	3- 5	2 3/4	- 5/8	-12.0
O	REYNOLOS & REYNOLO	13- 21	15 3/4	-1 3/4	-10.0
O	SCIENTIFIC CONPUTERS	1- 1	5/4	0	0.0
O	TYNSHARE INC	19- 28	25 1/P	- 1/2	-1.9
A	URS SYSTENS	3- 5	3 3/4	+ 1/8	+3.4
N	WYLY CORP	2- 7	2 5/4	+ 1/8	+4.7

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE JUN 30 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOORESSOGRAPH-MULT	8- 15	10	+1 1/8	+12.6
O	ADVANCEO MEMORY SYS	4- 10	7 3/4	+ 1/4	+3.5
A	ANPEX COPP	5- 9	8 5/8	+1 1/8	+15.0
C	ANDEMSON JACOPSON	2- 4	2 7/8	- 1/4	-8.0
O	APPLIEO DIG DATA SYS	13- 25	24 1/2	+ 1/4	+1.0
O	BEEHIVE MEDICAL ELEC	3- 9	7 3/4	- 5/4	-8.8
A	BOLT, BEPANEK & NEW	7- 11	10 1/2	+1 1/8	+12.0
N	BUNKEM-RAMO	5- 9	9	+1 1/8	+14.2
A	CALCOMP	4- 7	5 7/8	+ 1/2	+9.5
O	CAMBRIDGE MEMOPIES	2- 6	2 1/4	- 3/8	-14.2
N	CENTMONICS OATA COMP	20- 56	31 1/2	- 3/4	-2.3
O	COOEX COPP	22- 42	32	+ 1/2	+1.5
C	COGNITPONICS	1- 1	7/8	0	0.0
C	COMPUTER COMMUN.	1- 5	5 5/8	0	0.0
C	COMPUTEM CONSOLES	4- 7	5 3/4	0	0.0
A	COMPUTEP EQUIPMENT	1- 3	1 5/4	0	0.0
O	COMPUTER TPANSCEIVER	1- 3	1	- 5/8	-27.2
C	CONTEN	4- 9	7 3/4	+ 3/4	+10.7
N	CONRAC COMP.	20- 25	21 7/8	-1 1/8	-4.8
O	DATA ACCESS SYSTEMS	1- 4	5 1/2	- 1/4	-6.6
O	OATA 100	7- 13	9 1/8	- 1/4	-2.6
A	OATA PROOUCTS CORP	5- 12	11 5/4	+1 1/2	+14.6
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	OATUM INC	1- 2	2 1/4	0	0.0
O	OECISION DATA COMPUT	1- 4	2	+ 1/8	+6.6
O	OELTA OATA SYSTENS	1- 1	5/M	0	0.0
N	ELECTRONIC N & N	1- 5	2 1/2	+ 5/8	+17.6
O	FABPI-TEK	1- 1	5/P	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/4	- 1/8	-1.2
N	HARPIS CORP	34- 49	49 1/4	+1 1/8	+2.3
A	INCOTERM CORP	9- 20	12 1/8	+ 5/8	+5.1
O	INFOREX INC	3- 7	4 1/M	- 1/8	-2.9
C	INFORNATION INTL INC	10- 18	14 3/R	+ 1/8	+0.8
O	INTEL CORP	60-109	67 1/2	+5 1/2	+8.8
A	LUNOY ELECTRONICS	4- 7	4 5/8	+ 3/4	+19.5
O	MSI DATA CORP	5- 7	6 1/4	0	0.0
A	MILGO ELECTRONICS	15- 21	19 7/8	- 1/4	-1.2
N	NOHAWK OATA SCI	3- 8	7 3/4	+1 1/2	+24.0
O	PENMIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	5- 8	6 1/8	+ 3/4	+13.9
A	POTTER INSTRUNENT	2- 2	1 5/4	0	0.0
C	PRECISION INST.	7- 10	5	0	0.0
O	OUANTOP CORP	4- 5	4 5/8	+ 5/8	+15.6
O	RECOGNITION EQUIP	6- 11	9 3/8	+ 5/4	+8.6
N	SANOERS ASSOCIATES	6- 11	9 7/8	+1	+11.2
O	SCAN DATA	2- 4	2 1/8	0	0.0
O	STORAGE TECHNOLOGY	9- 15	11 1/4	+ 5/8	+5.8
O	T BAR INC	5- 10	5 1/2	- 1/8	-2.2
O	TALLY CORP.	4- 6	5	0	0.0
C	TEC INC	3- 5	3 1/2	0	0.0
N	TEKTRONIX INC	45- 64	64	+3 1/2	+5.7
N	TELEX	2- 5	4	+ 1/2	+14.2
C	WANGCO INC	11- 22	20 3/4	+ 5/8	+5.1
O	WILTEK INC	2- 2	2 1/2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PPICE 1976 RANGE (1)	CLOSE JUN 30 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	5	+ 1/4	+9.0
O	BALTIMORE BUS FOPMS	4- 5	3 1/2	- 1/4	-6.6
A	BARRY WRIGHT	6- 10	8	+ 1/8	+1.5
O	CYPERMATICS INC	1- 1	5/8	0	0.0
A	OATA DOCUMENTS	52- 42	51 1/2	-1 1/2	-4.5
O	DUPLEX PRODUCTS INC	15- 24	14 3/4	- 1/4	-1.6
N	ENNIS BUS. FORMS	6- 8	6 5/8	- 1/8	-1.8
O	GRANAM NAGNETICS	8- 13	8	0	0.0
C	GRAPHIC CONTPOLS	15- 19	15	- 1/2	-5.2
N	3M COMPANY	53- 65	55 5/8	-2 3/8	-4.0
C	MOOPE COPP LTO	40- 51	40 1/4	- 3/4	-1.8
N	NASHUA CORP	11- 17	15 7/8	+ 1/4	+1.5
O	STANOAPO REGISTEP	15- 19	15 1/2	0	0.0
O	TAB PPODUCTS CO	5- 10	9 5/4	+ 1/2	+5.4
N	UAPCO	21- 25	21 1/8	- 1/8	-0.5
A	WABASN MAGNETICS	4- 8	7 5/4	+1	+14.8
N	WALLACE BUS FORMS	19- 25	19 1/2	- 5/4	-3.7

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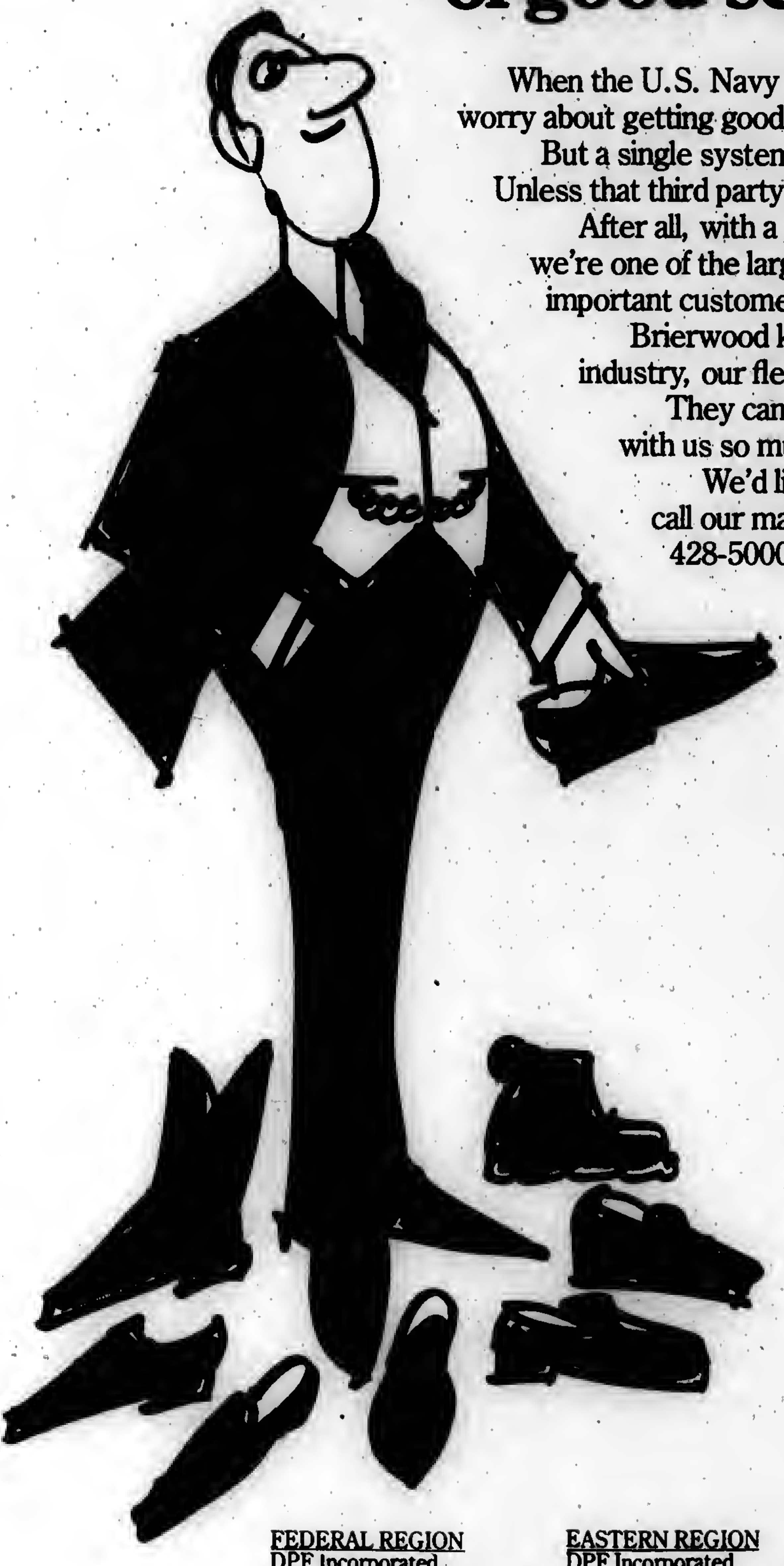

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.

5/year July 12, 1976 Vol. X, No. 28

The Privacy Commission: One Year Later

By Nancy French
Of the CW Staff

NEW YORK – Things aren't as bad as they may seem on the privacy front today, but they could get a lot worse if corrective action isn't taken soon, David Linowes indicated in a recent interview here.

Linowes, chairman of the Privacy Protection Study Commission established by the Privacy Act of 1974, said abuses of personal privacy reported thus far actually have been far fewer than originally expected.

However, he hastened to add, the potential for abuse – especially in computerized systems – is greater than he had ever dreamed.

Reflecting on testimony heard in the year since the commission began studying the privacy problem, Linowes said he believes the private sector should have to meet privacy and security standards for personal data under its care, as federal agencies are now required to do.

"Restrictions would not be catastrophic for private industry," he said. "I think the private sector is resourceful enough to work within these limitations."

Representatives from American Express, *Computerworld* and the Mail Preference Service have told the commission what they are already doing to comply with the wishes of subscribers who request that they be taken off mailing lists sold for other purposes, he said, but added government-imposed standards are probably not a good solution.

Instead, Linowes favors the concept of "voluntary compliance" as a means of finding out where the problems are – "at least initially."

The idea, as Linowes described it, would be to assign the job of formulating livable regulations to members of private-sector organizations.

"Once [industry members] have written the regulations, they can't object when they are made mandatory," he said.

Linowes believes laws that would cover the private sector's recordkeeping deserve careful consideration for two reasons. First, the private sector is so diverse the same rules may not be appropriate for each of its members and, second, industry maintains a huge volume of records – far more than most government agencies.

(Continued on Page 8)

IBM Charges Most Trial Testimony Unneeded

By Edith Holmes
Of the CW Staff

NEW YORK – Almost all of the testimony so far in the U.S. government's antitrust suit against IBM has been unnecessary, IBM attorneys claimed in an out-of-court conference here recently.

Lead IBM attorney Thomas D. Barr previously claimed that between 50% and 75% of the testimony was unnecessary [CW, Feb. 23], but in the recent conference raised that estimate to between 75% and 95% of the testimony in the now 14-month-old trial.

At the same time, Barr urged the judge hearing the case to force the parties to sit down and develop a "better road map" for the trial.

"We have now a situation where it is very difficult for us even to know who the next witnesses are going to be," he said. "We need a better road map, and I think Your Honor has, in that regard, a unique position," he added.

The judge, however, indicated he was reluctant to step into the matter since each side seems to have an emotional reaction to the other side which makes it hard to reach agreements.

Barr said "somewhere between 75% and 95% of all the factual statements made in this case" so far by government witnesses could have been stipulated, or agreed on by the parties in advance of the testimony.

When both sides in a court case stipulate the facts at hand, the court then accepts them as true and witnesses do not have to be called to testify to the truth of the statements.

Often the parties stipulate such things as the date of product announcements, positions held by various people at various times or the price of a product.

These items then do not have to be brought up and discussed with witnesses on both direct and cross-examinations, thereby shortening the time each witness has to spend on the stand and shortening the time the court has to spend to hear the case.

Few Stipulations So Far

The stipulations in this case, however, have been few and far between which has caused the witnesses to spend considerable time in court clarifying details.

To remedy this, Barr urged Judge David N. Edelstein to force the parties to sit down together and agree to facts that are not in dispute.

However, the government refused to comment on the proposal or on the idea of agreeing to more stipulations with the ultimate goal of shortening the trial.

This continuing silience on the part of the government is indicative of the breadth of the "philosophical or policy

(Continued on Page 2)

With Dual Systems Aboard Viking

Mission Sends DP 'Out of This World'

By John P. Hebert
Of the CW Staff

PASADENA, Calif. – Computers are taking the lion's share of the burden in providing this country with its first direct experience with a very close neighbor – the planet Mars.

Scientists at the National Aeronautic and Space Administration's (Nasa) Jet Propulsion Laboratory (JPL) here and Langley Research Center have been making a concerted effort to locate a new landing site for the Viking I spacecraft after the prime Chryse landing site was scrubbed a few days before the nation's Bicentennial celebration.

Sometime in the near future, General Electric Co. computers aboard the orbiter ship portion of the Viking craft will engage in a five-hour checkout procedure, turning on and off the active components on the Viking lander, according to Phil Cuddihy, lander system engineer with the Langley Research Center.

After the procedure has been completed and the working order of lander components verified, the data will be transmitted back to Nasa at a speed of 4,000- or 8,000 bit/sec, Cuddihy said.

If all goes well within the 25 hours preceding the separation of the orbiter ship and the lander, the lander will begin its descent, guided by dual Honeywell computers.

The dual computers in each Viking ship are playing no small part in the mission. "Computers are the brains of the lander and the orbiter and, without them, the mission would be dead," Cuddihy said.

Because of their importance, Nasa has installed redundant computers in both ships. If there was only one computer in a craft and it was lost, the mission would also be lost, Cuddihy said, adding he does not expect to lose any of the machines.

The computers in the orbiter, or the command and control sequencer (CCS), have a 4K-word memory and were used to initially move the ship into an orbit around the planet and to "trim" the orbit to Nasa's exacting specifications once there, he said.

The lander's computers – or the guidance control and sequencing computers (GCSC) – however, are the real stars. They will handle all of the sequencing necessary to guide the ship from separation to landing on the planet's surface and will handle all sequencing of data gathering and data communications once there.

Related stories on the Viking mission on Pages 4 and 6.

Computers on the lander are virtually identical and have 18K words of random-access memory in 25-bit words. "They're actually 24-bit words, with one bit for a parity check," Cuddihy explained. Each computer "block" weighs about 25 pounds, he added.

The Honeywell machine is a derivative of one of that manufacturer's product designs that was adapted and built for the Viking mission, he noted.

The lander will be entirely guided and controlled by the GCSC aboard the craft without intervention from earth-based operations once it has begun its descent,

(Continued on Page 6)

Reform Act Seen Cramping Style Of Interstate Network Users

By Ronald A. Frank
Of the CW Staff

NEW YORK – Passage of the Consumer Communications Reform Act would make it very difficult for users to operate interstate communications networks, according to regulatory experts here recently.

Under one of the principles of the proposed legislation, state regulatory commissions would have exclusive jurisdiction over computer terminal and other non-carrier equipment that now can be interconnected to the telephone network.

With state control, "many different standards for interconnection and interconnection policy" would result, and some states "may bar interconnection entirely," according to Herbert E. Marks, counsel for the Independent Data Communications Manufacturers Association (IDCMA).

Speaking at a recent meeting of the Association of Data Communications Users, Marks said this portion of the Reform Act "actually reflects a policy designed to foster the fragmentation of an integrated national telephone network."

Such a fragmentation would be "directly contrary" to previous positions taken by AT&T concerning the importance of having a single unified telephone system to best serve customers, he said.

"Even AT&T recognizes the need for uniform standards for the nationwide telephone network. Fragmentation cannot achieve such a goal," Marks said.

Turning to the effect of the proposed

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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.
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Up to 95% of Testimony Unneeded: IBM

(Continued from Page 1)

differences" between the legal teams to which Barr alluded in his remarks on stipulations, one observer said.

Completely in favor of "a more direct way, a common ground" to get at the facts, Edelstein suggested everyone involved in the trial "is a hostage.

"Now, why don't we start thinking in solid terms about bringing some proportions to this case?" he said.

Barr's remarks followed Edelstein's comments that, to the extent possible, he would have each side lay out as specifically as possible just what testimony it plans to present.

Encouraging the district court judge to take "what might be the most unique opportunity that any federal judge may ever have or will have for a very long time," Barr stated he would welcome the court's intervention to require the government and then IBM to spell out what would be offered as evidence.

Edelstein could get the parties started on this road, Barr stated, suggesting the judge is the only one capable of facilitating agreement between the government and IBM at this point.

"You put our heads together at a table and you make us agree, in the sense of saying, 'I can not understand why you refuse to stipulate this fact. It is true or it isn't true.'

"I sit here every day and think, 'My Lord, you know, most of that stuff is easy,' " Barr said, referring to the testimony over the last 14 months from only one-third of the government's scheduled witnesses.

Barr cautioned that he did not mean to suggest stipulations are easy or that such agreements can be reached in a couple of days. But recalling his experience in Telex vs. IBM, he reinforced his belief that such an effort can be worthwhile.

"Lead counsel and I spent days sitting across the table from each other stipulating facts until we went pretty kooky over sitting there and looking at each other," Barr said. But their efforts did reduce the time of the Telex trial to 25 days, he added.

"I think stipulations could replace trial days on the order of one day of stipulation for 10 or more days of trial, maybe 20 days of trial," he told the court.

After over 150 days of trial, Barr suggested no one would have very much to lose by spending two weeks or more to try to agree to a number of areas.

Emotional Factor Strong

While he agreed with the substance of Barr's comments, Edelstein said he had tried to bring about accord between the parties only to become "embroiled in your personal emotional reactions."

He stated he couldn't do more than encourage the attorneys to use "the long experience you have had together as adversaries to bring about a mood of cooperation. Let's get at facts that are really quickly ascertainable," Edelstein said, adding he had heard himself say that "ad nauseum."

But "I can't do any more," he continued. "I can't plant myself in your office; I can't plant myself in the middle of your conferences."

Edelstein referred to "the great stake" he has in this case, "the enormous consequences" the time it involves has for him. "As you know – it is no secret – I could have retired last year," he said.

"We are all going to get very much older if we don't find a way of shortening this," the judge said, suggesting that, at the case's current rate, those who are young now will be old when a final decision is reached.

Can the case be shortened through stipulation and agreement? "Nothing is impossible," the judge remarked that day in court, "but things are not quite as possible when we are living in an armed camp."

Act to Impact Interstate Nets

(Continued from Page 1)

legislation on existing independent equipment available to users, Marks said many of the independent suppliers would be forced to change their business or go out of business.

Decreased research and product development will follow because the telephone companies "will not have any incentive to provide the full range of devices that are necessary . . . for computer systems," he said.

The phone industry does not have a full line of computer communications equipment, and the "record deomonstrates that many of the recent advances in such equipment have been the direct result of competition," Marks said.

Funds paid out by AT&T to support its legislative efforts came under fire recently at another meeting when John Guttenburg, vice-president of Data Transmission Co. (Datran), revealed that in 1975 Bell paid out $39,527,095 in advertising.

Speaking at a recent debate on the Reform Act in Cleveland, Guttenburg, representing the Ad Hoc Committee for Competitive Communications, said these advertising funds were taken from phone bills paid by many customers of the Bell System [CW, July 5].

Much of Bell's current promotional material is designed to solicit support for the Reform Act from both legislators and the public, although exact numbers are hard to define.

Bell's profits have continued to rise with earnings for the second quarter jumping 14.4% over the comparable period of last year. With this type of financial picture, it is doubtful Bell is cutting back on its advertising expenditures.

In 1975 AT&T paid $220,780,876 in consulting fees, Guttenburg said. Among these expenditures was $63,916.32 to Professor Eugene V. Rostow of Yale University who was paid to produce a policy paper supporting the proposed legislation.

Rostow's supporting analysis was among the documents sent by AT&T to stockholders and employees.

This article is one in a series describing various aspects of the Consumer Communications Reform Act of 1976, now pending in both houses of Congress.

To inform members of Congress and others interested in the proposed legislation, both the Federal Communications Commission (FCC) and the White House Office of Telecommunications Policy (OTP) have issued position papers.

"Enactment of the proposed legislation would disserve the public interest by limiting important consumer rights," the FCC said.

In a preliminary report on the effects of competition, the FCC said "competition in the private line and terminal equipment [areas] has had no discernible effect on the revenues and earnings of the telephone industry, nor on the rates for basic telephone service."

There is no valid reason for concluding this situation is likely to change within the next three to five years, the FCC report said.

The proposed legislation would result in the "virtually complete monopolization of an industry in which historical, technological, and economic considerations suggest . . . free market forces are quite capable of serving the best interests of the public," OTP said.

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Aids Study of Viking Data, Pictures

Package Has Celestial Purpose in Martian Mission

By Don Leavitt
Of the CW Staff

PASADENA, Calif. – A software package used by many installations has been combined with technology not available to most to help technicians at Jet Propulsion Laboratory here study the data and pictures being sent back from Mars by the Viking I spacecraft.

While control of Viking and the capture of transmissions from it require rather exotic communication systems [CW, July 5], Mark IV from Informatics manages the final link between the pictures and the analysts who want to use them, according to Dr. Edward Y.S. Lee.

The whole process begins when still pictures are taken line-by-line by a pair of TV-like cameras and stored in digitized form with identifying information on magnetic tape aboard the spacecraft, he explained. The data added to the picture itself tells which camera took the picture, when and where.

The earth-bound transmissions include data about conditions aboard Viking itself and "a certain level of 'noise' " resulting from the distances involved, as well as the pictures, Lee said.

The first level of processing eventually filters out all the undesired material and recreates, when necessary, whole lines of a picture that may have been lost in transmission.

Handled largely with "quite sophisticated" Fortran programs, the first-order processing will become more complicated later this summer when Viking II, already on its way to Mars, adds its stream of data and pictures – again from a pair of cameras: one on the orbiter portion; one on the lander unit of the spacecraft – to the traffic now coming in from Viking I.

'Massaging' Pictures

Second-order processing involves "massaging" the pictures as received; enlarging "interesting" portions, rotating the views to gain new perspectives and enhancing the images through various techniques. This work is the responsibility of the Image Processing Laboratory where Lee works.

Equipment there includes an IBM 360/65 with 1M-byte of core, eight IBM 3330-equivalent disk spindles and seven tape drives operating under OS/MVT with Hasp and Time-Sharing Option (TSO). A Digital Equipment Corp. PDP-11 is used as a front-end interface to many display TV monitors and "various" interactive, on-line terminals, Lee said.

While the lab has a range of application programs and software tools to work with batch-mode image processing jobs, it uses Mark IV/Model 260 Version 5.0, several special options and some in-house innovations to manage on-line accessing of the picture catalog data base by the non-DP-oriented technicians.

The picture catalog is very similar to a card catalog in a library, according to Lee. Each entry corresponds to an image taken on Mars, he explained, but there are many more items of information than in a card catalog.

Thanks to the second-order processing, one picture may have many versions, a processing history record and many forms of output, each stored in a specific place.

These may include digital copies stored on disk to be displayed at a TV monitor, a file "written out" on a reel of magnetic tape, a hard-copy photograph or a negative, Lee said.

To keep track of the interrelationships, the picture catalog has been organized as a hierarchical file structure. Lee expects this to grow "almost exponentially" as the mission continues. The number of basic images will increase and so will the number of versions of each as the technicians study them more closely, he said.

The technicians' requests might be as general as asking for a listing of all pictures dealing with a part of the Mars surface – the proposed Viking landing site, for example – or as specific as all pictures of an area taken when the sun was directly overhead. The identifying data added to each picture as it was made or as its image was later processed would provide the means of meeting such requests, Lee said.

To support on-line use of the picture catalog, Lee's team first recognized several phases or components that make up any on-line user request. Then they built a system to cope with the requests, based largely on the capabilities of Mark IV's On-line Query Language (OQL) and Online Executive (OLX).

Novice User Requests

They reasoned that users familiar with TSO and working with keyboards could manage their own requests, but that others clearly needed help to reach the data they wanted. Instead of forcing these occasional users to fully program their requests, the Data Library Team developed a series of Command Lists (Clist) which required only the naming of parameters before being used.

For continuity between experienced and novice users, the team decided the Clist syntax should be very similar to TSO and conventional Mark IV commands; they should cover all phases of an on-line request receipt and response; and they should be easy to invoke.

Also recognizing the need to interface with other application programs, the team developed more than a dozen Clists, including "at least one" for each phase of an on-line request and several combinations so various phases could be run consecutively.

They also determined several ways to implement the Clists as implicit commands which could be invoked without using the TSO EXEC command.

As simple as use of the Clists seemed to be, Lee's team still realized some of the technicians would need occasional clarification on a specific point. User documentation, developed concurrently with the Clists, was formatted as a HELP data set partitioned under TSO which could be evoked from any user terminal.

This approach also provided a means of keeping all users posted whenever changes are made in any of the Clists.

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Models Readied to Help Interpret Data Sent by Viking

CAMBRIDGE, Mass. – Two MIT researchers here have prepared computer models of the interior of the planet Mars to facilitate the interpretation of data that will be sent from the two Viking spacecraft slated to land on the planet.

While the bulk of the experiments on the two Viking craft, one of which should touch down later this month and the other in September, arc devoted to detecting the presence of life on the planet, each spacccraft will carry a seismometer to detect "Marsquakes" and to help determine the structure of the Martian interior.

The computer models of the planet's interior wcre prepared by Prof. M. Nafi Toksoz and David H. Johnston, a graduate student, in MIT's Department of Earth and Planctary Sciences.

The models were developed on an IBM 370/165 at the school. The main computer effort – required to work on intricate mathematical computations – supports a very detailed model which takes a full 10 or so minutes of machine time to compute, Toksoz said.

The modeling predicted the structure of the interior and the size and composition of the core and mineral assemblages of the Martian mantle. The researchers found that Mars is similar to the earth in many respects, but that it differs from the moon.

Data from the previous Mariner obiters, including observations of Mars' gravitational field, its shape and topography and photographs made of the surface, provided the basis for the models.

Toksoz and Johnson calculated the changes of density with depth in the planet. From these models, they concluded that, like the earth, Mars has a large, 1,250 mile radius molten core, but that this core is less dense than the earth's.

The most useful information for the interpretation of the data obtained from the Viking seismometers will be found by using the density models to calculate the velocities of seismic waves in Mars that might be generated by Marsquakes, Toksoz said.

Toksoz and Johnston predicted Marsquakes will occur and will be more prevalent and energetic than quakes detected on the moon. The seismic activity in a planet is a good indicator of its internal temperature, energy and tectonic rigor. Viking seismometers will give a good measure of this; they will also enable the seismologists to determine the size of the Martian core and structure of its mantle and crust.

The interpretation of such data in terms of the theoretical models will help to define more closely the internal state of Mars and its comparison with the earth and moon. Ultimately this will enable scientists to place the earth, moon and Mars in proper context in the solar system with regard to the formation and evolution of the planets, the team said.

DP Goes 'Out of This World'

(Continued from Page 1)

Cuddihy said. This is because radio transmissions take a full 18 minutes to reach either destination – which will be about 201 million miles apart on the touchdown date later this month.

Once on the surface of Mars, the computers will issue commands for the execution of the organic analysis experiments and the taking of individual and stereoscopic pictures, among other functions, Cuddihy said.

During these operational sequences, the machines will keep the lander's transmitter in constant orientation toward the orbiting ship and send the accumulated data to ultrahigh frequency (UHF) receivers there at a rate of 16 kbit/sec, Cuddihy said.

By the third day on Martian soil, scientists back on earth may decide they have enough initial information and will be able to update and reprogram the computers to perform additional functions.

The landing site change posed only minor problems to the orbiting craft and the lander. Nasa engineers reprogrammed the lander computers to separate from the orbiter at a different time during the closest point, or periapsis, the ships would pass by Mars' surface – a distance of about 930 miles, Cuddihy said.

The sophistication of the mainframes aboard the lander is marked by their ability to shut down if there is a power failure and come back up when the failure is over and their ability to carry out a sequence of emergency procedures in the event of computer failure after landing, Cuddihy said:

In the latter case, the device will send out a data sequence once every minute over the orbiter relay station and back to earth to tell where the computer failure is located, he explained.

In the JPL Space Flight Operations Facility control center, six large CPUs and associated systems will have an integral part in collecting and analyzing the incoming data.

For the most part, three IBM 360/75s will handle data from the lander, including real-time command telemmetry processing, batch processing and project development data processing, respectively.

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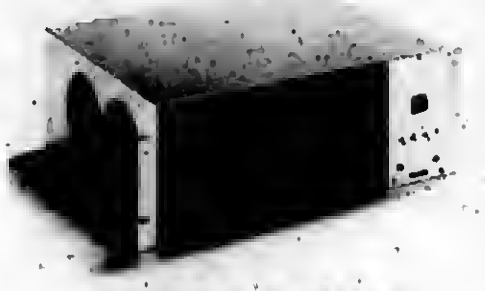

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Shutdown of Three Vendors' Operations Not Daunting Faith in Future of POS

By Toni Wiseman
Of the CW Staff

Retailers and supermarket operators seem to be caught in a whirlpool which has dragged three vendors under in the recent past.

The point-of-sale (POS) operations of MSI Data Corp., Singer and Bunker Ramo already succumbed to the deep; how many more will follow? Is there indeed a "drowning" trend? What do recent events portend for POS?

There are two main points of agreement among retailers, vendors, consultants and industry experts: first, that POS is here to stay and, secondly, that NCR and IBM are the only two "giants" who are going to stay afloat.

"POS is still the way to go," Jim Quigley believes. Quigley is the DP manager for Hess' in Allentown, Pa., a store which currently has 450 Singer terminals and seven Singer System Tens.

Quigley thinks it is "sad" that Singer is leaving the industry because it "has excellent systems," but he doesn't think the industry is going to fold as a result.

"What this means is that there will probably only be IBM and NCR left, which will not give users the selection they should have," he stated.

Short on Sympathy

The National Consumer's League, headquartered in Washington, D.C., is short on sympathy for the floundering hardware companies. "They should have test marketed before they went into [the POS market] and they would have known what to expect," a spokeswoman said.

"Modernization isn't always the best thing," she remarked, but added she does feel sorry for the computer vendors' employees losing their jobs because of the closings.

Len Farano, executive vice-president of Gambit Management Strategies, feels the POS market per se – the sale of terminals – is a marginal market in the sense that it is hard to make a lot of money just selling terminals.

"The payoff will come if you have a tie-in sale for the terminals – in other words, a mainframe. And at the present time only two POS vendors, NCR and IBM, have that tie-in," he said.

"Singer, for instance, didn't. It had a great customer base in terms of terminals, but didn't sell CPUs bigger than System Tens, which is not a big money market.

"IBM, on the other hand, doesn't work without a 370, which is a clever marketing approach. Everyone said, 'How terrible to force a retailer into buying the mainframe,' but if you notice, IBM is still in the marketplace," Farano stated.

Three years ago Gambit predicted the total POS market could not support more than two major vendors, plus a couple of "dwarfs," Farano recalled. Today, it is sure NCR will be one of the major suppliers.

Unitote/Regitel still has a hard row to hoe, but has been successful so far, and Sweda has good gear but its marketing approach has vacillated too often in the past to really make any conclusions, Farano stated in a snapshot view of the market.

Two Ways to Revamp

Two things could revamp the POS market, Farano said.

"Vendors could sell cheaper terminals and supply a total system," he said. They might not even sell the retailer terminals, but rather provide a service with terminals hooked into a service bureau, he suggested.

"Or, for the $5 to $15 million retailer, they could still sell terminals, but lower the back-end cost by supplying him with an in-house mini," he said.

Service Bureau Corp. (SBC) seems to agree with this philosophy because it recently acquired CRI Data Services, Inc., a New York-based data management service for retailers.

While SBC declined to comment on its views of future trends, a company spokesman noted it "got into the business because we saw a need for a data service organization geared to the needs of retailers. And with our network across the nation, we thought it would be a natural."

While SBC currently only polls terminals or processes information sent to the service bureau, the spokesman said terminal rentals were not out of the question in the future.

More than one industry source said the future of SBC looks bright, or "water-tight," particularly since it is picking up many Andracor customers, a retail service bureau arm of Boeing Computer Services which has not kept its head financially above the corporate watermark, according to sources.

Irving Solomon, vice-president of the National Retail Merchants Association's (NRMA) Information Systems Division, feels consumers and unions have turned food retailers away from POS and, as a result, vendors are taking each order and making it a special order.

Retail stores, however, will keep on ordering equipment, particularly as the mechanical registers become obsolete, such as the NCR 52s which are now 10 years old, he said.

The NCR 250 and 255 series and the Sweda 800 series will be popular among small store operators since they can be used as bookkeeping devices as well as cash registers, he said.

"The POS market is still open," Solomon said. "There are over 170 stores now being polled or sending in cassettes for processing, and that number is growing."

Like others before him, Solomon said he is sorry about Singer, but added more than 80 stores with Singer equipment have called and reported they want to order more terminals before Singer discontinues production.

NCR is also doing well, he noted, and IBM has more orders than it can handle productionwise.

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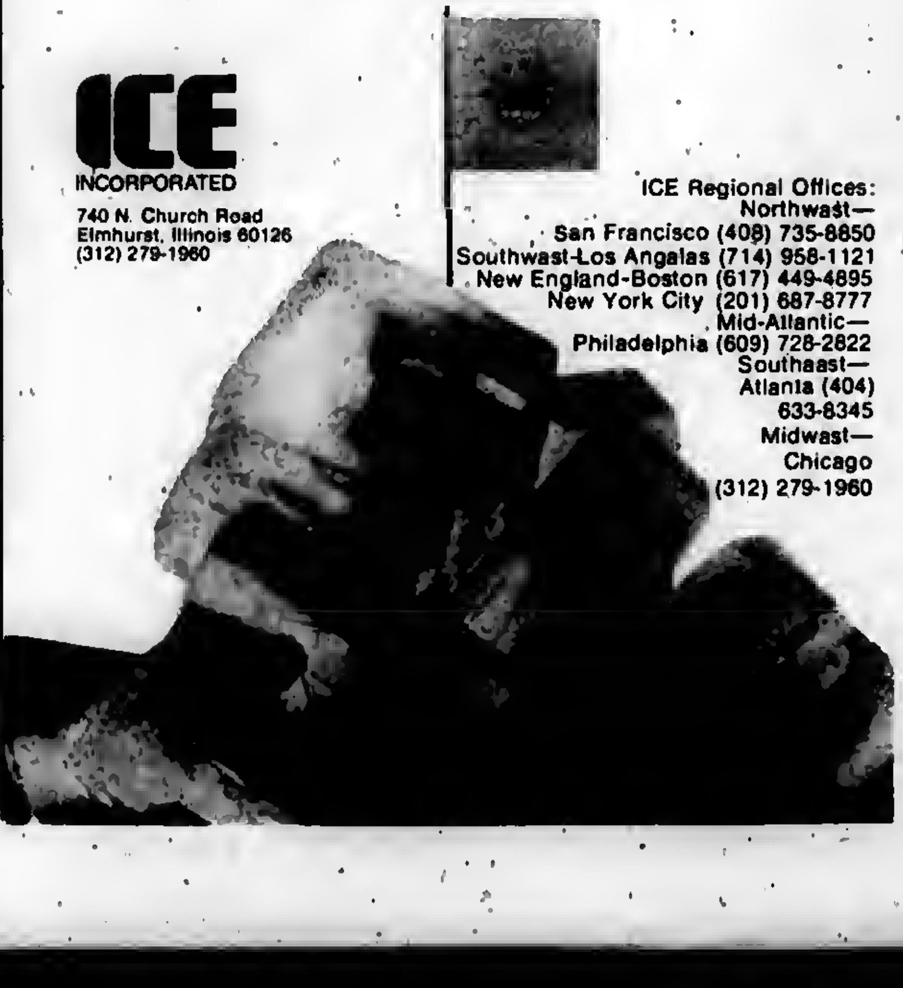


Privacy Unit Head Sees 'Undreamt of' Abuse Potential

(Continued from Page 1)

The Reuben H. Donnelley Corp., for example, a firm that provides marketing services such as sales promotion campaigns for manufacturers, maintains as many as 100 million personal records, Linowes said.

By comparison, the Internal Revenue Service, one of the largest recordkeeping agencies in the Federal government, maintains only about 70 million records.

"Three-fourths of those who testified said they believe the information they keep is safe," but many were startled when he asked who would be controlling their companies – and thus their information – tomorrow, Linowes recalled.

In posing the question, Linowes said, he was thinking about the foriegn interests who are buying American and Western European companies.

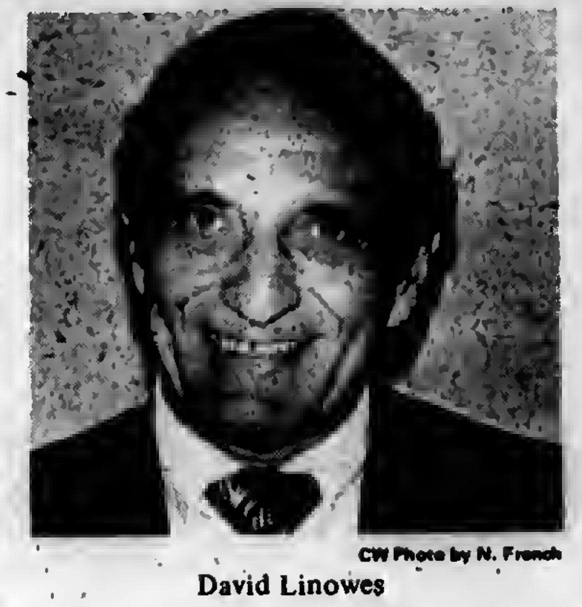
Furthermore, "we also know that organized crime has some very interesting fronts," he said, noting that if information is power, as everyone says it is, "I think we can expect subversion and organized crime to get into the information business before long, too."

Linowes refused to elaborate further for quotation on this chilling prospect.

Linowes called the privacy violations allegedly committed by 56 insurance companies named by a federal and grand jury in Denver [CW, June 28] "the most serious indictment against any industry to date.

"Insurance industy representatives who testified at our Los Angles hearings at the same time the Denver district attorney appeared claimed not to know anything about it," Linowes said.

"We don't know how high up in the industry this thing goes, but we do know that clerks don't have the authority to hire attorneys and private investigators," he added.



CW Photo by N. French

David Linowes

William O. Bailey, president of Aetna Life and Casualty Co., who also serves on the commission, "wasn't there to hear it," Linowes said.

Because computers can do so much so fast, Linowes places them at the source of privacy abuse. "Already they are being used to identify any kind of special interest group you could want – from inquisitive kids to affluent Catholic professionals to fat cats for political contributions. And new applications are being dreamed up every day.

"Even so, computers are only being used at 10% of their capacity," he said.

Computers have changed the face of social science research, he said, adding the commission has felt strong resistance from academic and medical researchers who don't want their access to personal records limited.

For these reasons, the privacy problem "will have to be monitored by Congress long after the commission is disbanded," he said.

Commission's Accomplishments

As for the commission's accomplishments to date, Linowes said, "For one thing we've laid to rest many of the fears expressed about use of the Social Security number as a universal identifier" after it was learned the private sector hardly uses it at all.

He also cited completion of the commission's investigation and publication of recommendations on curbing the Internal Revenue Service's use of personal information. Its recommendations on mailing lists will be published soon, he added.

Still to be heard by the commission are representatives of the credit reporting industry, "the central nerve center of the information industry," according to Linowes.

As for the question of who actually owns personal data – the data subject or the organization that maintains it – Linowes was evasive.

"We're leaning toward recognizing individuals' claims to such information, and the opinion of every vested interest in the nation is being heard before we make that decision," he said.

Whatever the commission decides, those decisions will still have to go through another crucible – the U.S. Congress – before anything comes of them.

Although Linowes indicated his position as a partner in the New York accounting firm of Laventhol, Krekstein, Horwath and Horwath gives him access to the good life, he denied having any bias toward business.

"But business executives are Americans, too," he said, "and by virtue of their privileged position in society, they actually enjoy more benefits provided by the Constitution and our form of government than the ordinary citizen.

"If the right to privacy is lost in this country, they have far more to lose, and I think they realize that," he said.

In his own defense, Linowes pointed out President Ford had no reason to select him to serve on the commission: "I've been an active Democrat all my life, and I think my record speaks for itself."

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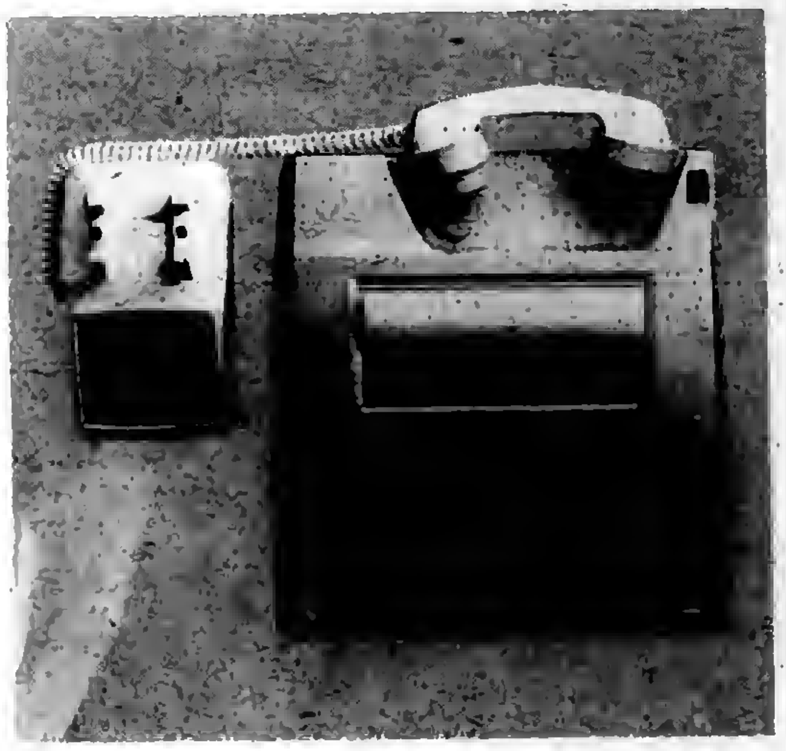

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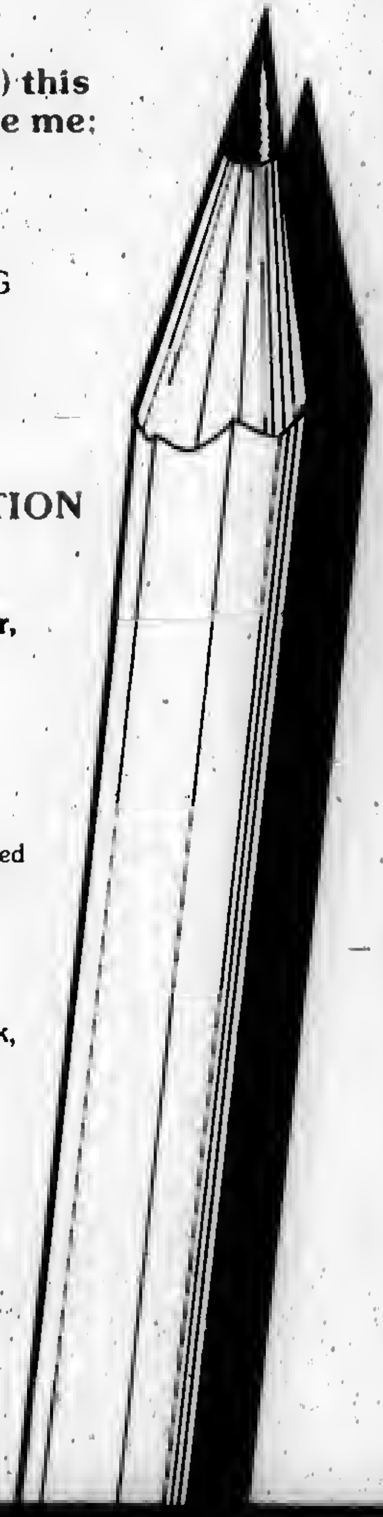

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ABA Head Calls EFT Inescapable Reality for Banks

OSAGE BEACH, Mo. – Each and every bank in the U.S. has entered the world of electronic funds transfer (EFT) or will soon do so. No banker can realistically say, "Count me out," and a prime example of this is the direct deposit of Social Security checks, according to J. Rex Duwe, president of the American Bankers Association (ABA).

"The government is cutting the costs of processing and delivering recurring Social Security and Supplemental Security checks by using an electronic process – namely automated clearinghouses," Duwe told a recent Missouri Bankers Association meeting here.

In a review of EFT news, Duwe discussed the issue of customer-bank communication terminals (CBCTs), predicting the whole question of whether they are to be considered bank branches will eventually wind up in the Supreme Court.

But, he said, the decision on CBCTs should not be whether EFT facilities are branches. Instead, the law should be defined by a debate on EFT, not a debate on what "branch" means.

ABA's position is that CBCTs are new devices for delivering traditional services – not in changing those services – and that they should be allowed, Duwe stated.

"Bank branching laws, by definition, only affect banks. If we alone are blocked from installing electronic terminals, our competitors would gain an unfair advantage," he said.

"CBCT rulings don't affect thrifts and they certainly don't affect Penney's, Sears and Montgomery Ward.

"But these retailers are our financial competitors too. Right now, they are offering a tremendous amount of credit to our mutual customers.

"These retail outlets are installing computerized cash registers that could easily be used to accept the equivalent of deposits," Duwe stated.

Privacy Commission Sets Hearings On Health Care Providers' Records

WASHINGTON, D.C. – The Privacy Protection Study Commission will hold hearings on the recordkeeping practices of federal agencies involved in health care services and health research July 20-21 in Room 2358 of the Rayburn House Office Building here.

The hearings will supplement the commission's inquiry into the recordkeeping practices of private-sector health care providers held last month in Los Angeles.

The commission will concentrate on development and use of medical records by federal health care providers and institutions such as the Public Health Service, Veterans Administration and the Defense Department.

Allied users of medical records such as utilization review programs, biomedical and health services research and peer review organizations will also be examined.

The commission is especially interested in examining the conditions under which records have been disclosed to other health care providers, institutions and third parties, a spokesman said, and will explore the procedures which permit an individual to access and review his records.

Individuals who wish to submit their views or testify can contact the commission's director in writing at Suite 424, 2120 L Street N.W., Washington, D.C. 20506.

DP Exhibit on View For Boston Visitors

BOSTON – When tourists' feet begin to ache from tramping the Freedom Trail here this summer, they can recuperate at a computer exhibit at the Boston Museum of Science.

The focal point of the $350,000 exhibit is a Honeywell 316 minicomputer connected to seven video-display terminals which can be operated by visitors.

The terminals allow visitors to play games, make math calculations and retrieve information about the museum, such as available guided tours, the restaurant menu and a message from the director.

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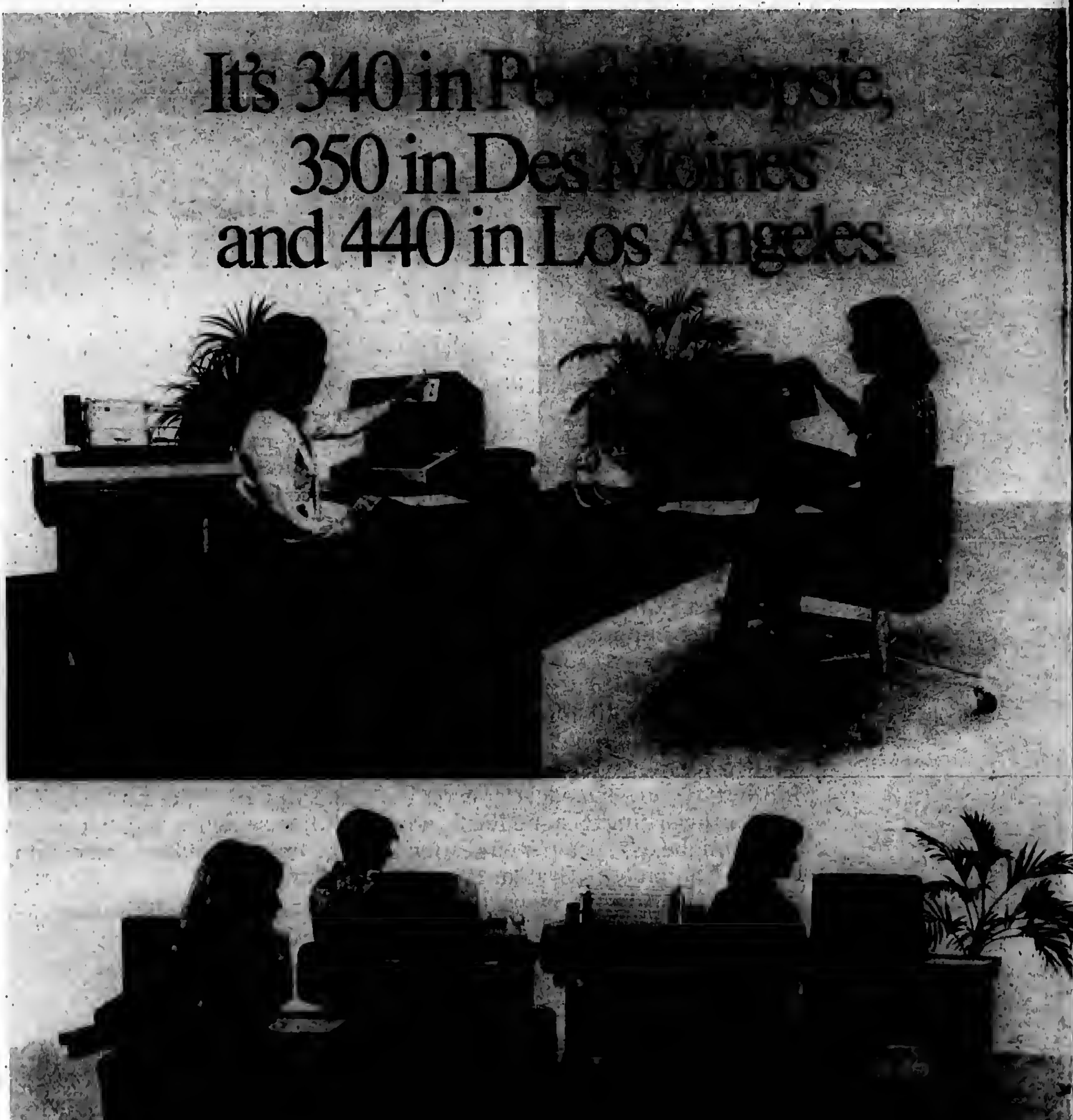

To Administer, Enforce Law

Control Board Included in Privacy Act Passed by Ohio

By Nancy French
Of the CW Staff

COLUMBUS, Ohio – This state has become the sixth in the nation to enact a law regulating the use of personal information by state and local governments.

But, unlike most other states, this one set up a control board appointed by the governor to enforce and administer the information practices spelled out in the law.

Among its responsibilities, the Ohio Personal Information Control Board, as well as the state's Department of Administrative Services, has been authorized to exempt a personal information system from the law if disclosure of that personal information would not endanger an individual's personal privacy.

The law, effective next Jan. 1, will apply to all state and local agencies, including the state university system. However, law enforcement records and all records considered "confidential" under existing law will be exempt.

The law requires information keepers, upon request and proper identification of any person, to:

- Inform that person of the existence of a file of personal information about him.
- Permit that person or his attorney to inspect the information.
- Inform the person about how the information is used and who is usually granted access to the information.

If a person disputes the accuracy, relevance, timeliness or completeness of the personal information on file, he may ask the agency to investigate the current status of the information.

After investigation, the agency must notify the individual of its findings and the action it plans to take on the disputed information.

The agency must delete any information it cannot verify or finds inaccurate. Following such a deletion, the agency must notify the individual and any person designated by the individual that the deletion has been carried out.

If the individual is not satisfied by the agency's decision, the agency must permit the individual to file a statement that is included in the system of records. The statement may be limited to 100 words providing the agency assists the individual in drafting a clear summary of the dispute, the law said.

That statement must be included with any information subsequently transferred, reported or disseminated. If the agency believes the statement is frivolous or irrelevant, it may file its own statement and include it with all information transfers.

Annual Inspection Only

A person may inspect records of personal information maintained about him by an agency only once per calendar year unless rules adopted by the control board permit more frequent inspection, according to the law.

Psychiatric or psychological information maintained on a person may be disclosed to the person's personal physician, psychiatrist or psychologist or to any attorney who presents a signed, written authorization from the person, but not to the person himself.

As part of their new responsibilities, every state and local agency must file a notice of the existence and character of its personal information systems every January.

Every state and local agency that plans to establish a new personal information system on or after Jan. 1 or substantially enlarge or change one it has must file notice of those plans.

Every state or local agency that maintains a personal information system must appoint one individual to be directly responsible for the system and implement rules for its use that comply with the law.

Employees responsible for operating or maintaining a system must be informed of the law and its provisions. Further, state and local agencies must specify the disciplinary action that will be taken against an individual who violates the law.

When obtaining information from an individual for use in a data file, an agency must inform the individual whether he may refuse to supply the information requested.

The requested information must be necessary and relevant to the functions that the agency performs by statute, ordinance, code or rule, the law said.

When information in a system is no longer timely, the law requires elimination of the data.

The Department of Administrative Services and the control

(Continued on Page 12)

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'Thirty Year Law' Cited as Risky Axiom for DPers

By Toni Wiseman
Of the CW Staff

CHICAGO – "The 'Thirty Year Law' says we tend to mishandle threats which occur less frequently than once in 30 years because 30 years is the limit of an individual's direct experience," Robert Jacobson, vice-president of Chemical Bank, said here recently.

"DP managers have the tendency to say, 'If I've been in DP for 15 years and never seen it happen, I don't believe it ever will happen to me,' " Jacobson told attendees of the 1976 Computer Protection/Insurance seminar cosponsored by the publishers of *Computerworld* and *Business Insurance*.

In the same way, DP managers tend to say that they aren't going to enact a certain security measure because it isn't perfect, he said.

"But no security measure is perfect. The task before us is to reach the point where the cost of security measures balances out against the expected loss reduction," he noted.

The computer environment presents two special problems to the risk manager, Jacobson said. These are the rapid change in technology and the very limited experience available which makes risk evaluation based on past experience very shaky – particularly to the DP industry, which itself spans less than 30 years.

The future offers key technical and operational challenges, he said. For instance, electronic funds transfer (EFT) and point-of-sale systems are introducing a new factor: the electronic interface between parties to a financial transaction.

At the same time, he said, a new technical problem is appearing, that of identifying the person at the far end of a wire. The problem is to know "who you are, not what you have or what you know," he said, comparing EFT verification to a person walking into a bank with a paper bag over his head.

Current planning and operating systems are placing increased emphasis on security, reliability and integrity, Jacobson said. At the same time, however, they are highlighting the need for one-of-a-kind production inspection techniques in terms of technical design standards, operating standards, quality assurance and change controls.

Criminal Population Growing

Another new factor, one affecting computer crime, is the growing population of potential computer criminals and the increasing number of opportunities.

"Today we're training kids in primary school in computer science," Jacobson noted. "There is a fraction of us who are inherently crooks, it's sad but true, and they are getting educated along with the rest of us."

So the problem is now one of better audit and control techniques for "suspicious activity reporting" and better system design, he said.

Finally, he said, there is another new factor introduced by on-line teleprocessing systems – the growing dependence in daily operations on real-time systems which are inherently difficult to back up.

The industry now faces the problem of developing cost-beneficial backup techniques which may include an analysis of costs and penalties of delays, alternate modes of "nearly real-time" operation and alternate/standby hardware and telephone circuits, he said.

Ohio Privacy Act Sets Up Board

(Continued from Page 11)

board must adopt standards for interconnection or combination of personal information systems maintained by more than one agency and adopt rules that provide a means for people to be informed of or trace their personal information when it is combined with that of any other system.

In addition, the Department of Administrative Services and the control board must set up rules authorizing the types of disclosures or uses of personal information by agencies when new programs are developed or when public health, safety or welfare is involved.

They also must set rules that authorize access to personal information in instances beyond those provided for by the privacy act itself.

Further, the two bodies must provide standards for security.

A person harmed by the use or disclosure of personal information relating to him may recover damages in a civil action from any agency which:

- Intentionally maintained personal information known to be inaccurate, irrelevant, no longer timely or incomplete.
- Intentionally used or disclosed personal information in a manner prohibited by the law.
- Supplied to another agency personal information known to be false.
- Intentionally denied a person the right to inspect and dispute personal information when it might have prevented harm.

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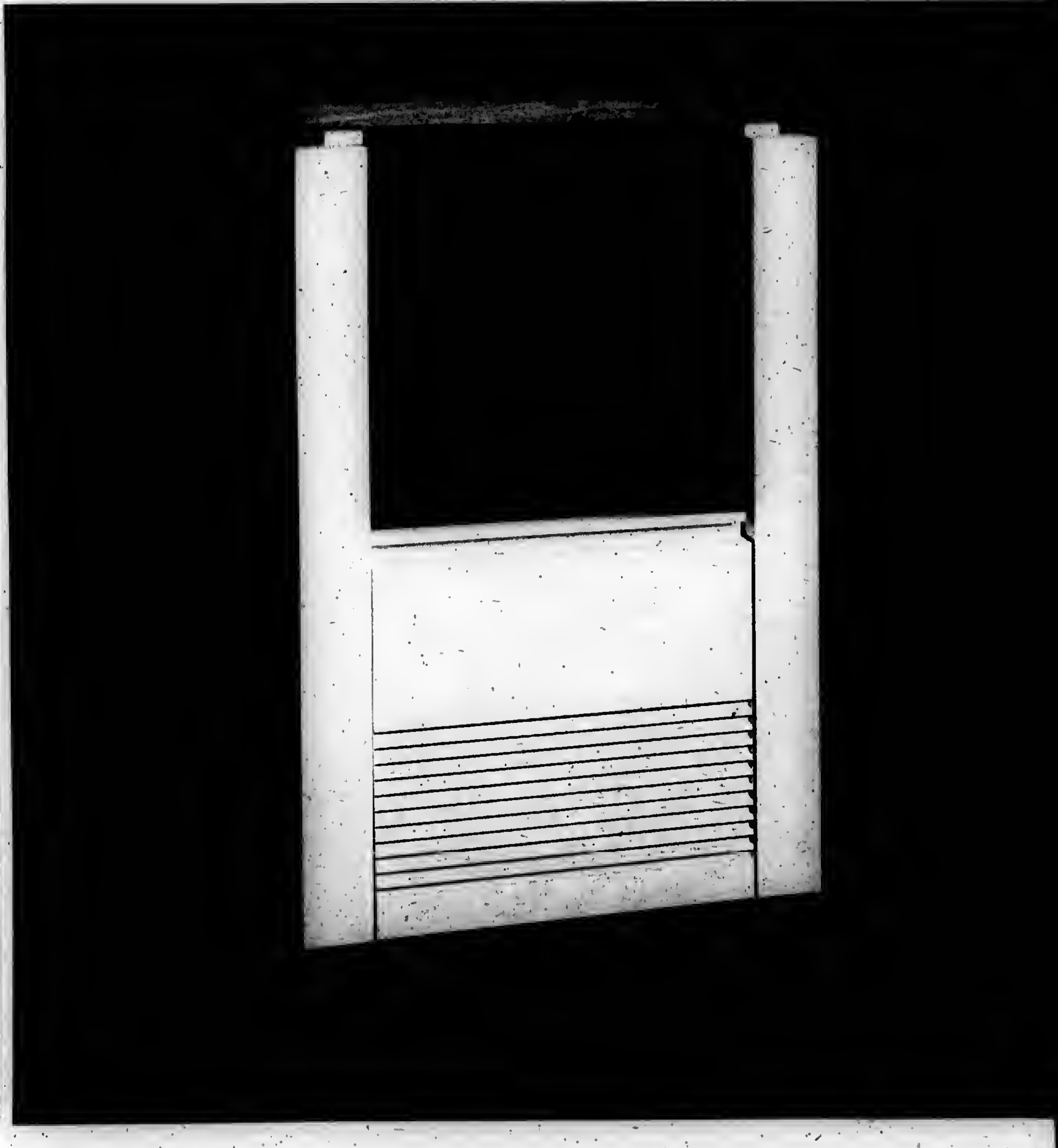

With Advent of Telecommunications

Insurance Problems Facing DP Managers Seen Altered

By Toni Wiseman
Of the CW Staff

CHICAGO – The advent of telecommunications has altered the insurance protection problems facing DP managers and risk managers, according to Rees S. Himes, assistant vice-president at Marsh & McLennan, Inc., here.

Some of these problems can only be controlled by security methods, and some are better controlled by insurance or a combination of both, Himes said recently.

The various specialized DP insurance coverages normally sold to policyholders include DP equipment, DP media, valuable papers and records, business interruption, extra expense, errors and omissions, personal liability and crime, he said.

An additional type of insurance should be made available to DP installations – one to cover external loss – Himes told an audience at the 1976 Computer Protection/Insurance seminar co-sponsored by the publishers of *Computerworld* and *Business Insurance*.

Current policies afford no coverage for the theft of property or of computer usage by those who are not employees of the company, he said.

Lloyd's of London, however, is working at developing a coverage which will be known as "computer external crime insurance" and will cover policyholders against financial loss arising out of the theft of property such as inventory or against financial loss arising out of theft of computer time, he said.

The purpose of DP equipment insurance is to provide capital for the replacement of equipment damaged by fire, water, earthquake or other hazards not specifically excluded from the policy, Himes said.

The problem is how to determine values so the loss recovery will be adequate, Himes said.

In view of the rapid obsolescence of computers, a policy should pay the cost to replace the damaged equipment with equipment of the same kind and quality, he added.

"This requires that the amount of insurance be declared on that basis and not at original cost," he advised. "It also requires a frequent upgrading of the insured amount to avoid a coinsurance penalty. This is especially true during these times of high inflation."

There is also functional replacement valuation, but it is fairly uncommon, Himes noted.

Under this type of policy, if a policyholder feels he would like to upgrade his present equipment, should he have to replace it because of loss, he may do so by declaring the value and nomenclature of the equipment he intends to use following a loss.

Media Coverage

The most commonly purchased insurance is media coverage, yet its purpose and scope are often misunderstood, Himes said.

A user may insure all media for a blanket value, in which case the coverage will replace only the damaged disks, tapes, etc. and pay for the cost of copying data onto the media.

The second way to insure media is to set an agreed value on each disk, reel of tape or punch card. The valuation will then include the cost of media, copying and the cost of research to recapture lost data.

"Valuable papers and records insurance covers problems similar to media insurance, except the policy covers data which has not been put into a DP format," Himes said.

The second most commonly purchased coverage is extra-expense insurance which provides the necessary cash to continue operation after a fire or other hazard has disrupted operations.

"Extra-expense insurance is not a substitute for a disaster plan. If alternate methods of continuing operations are not available, operations must cease and an insurance recovery will not be made," Himes added.

Business interruption insurance does not include extra-expense coverage, Himes cautioned the seminar audience. It is designed soley to provide a policyholder with enough money to finance its fixed expenses which continue after a loss and to reimburse the policyholder with a sum equal to any profits which would have been earned had there been no disruption of operations.

Finally, there is errors and omissions liability insurance, a different type of policy entirely.

"Errors and omissions liability insurance protects you from legal suits arising from your negligence with regard to a third party," he said.

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Editorials

Dirty Tricks

The dirty tricks allegedly employed by some 56 insurance companies to illegally obtain individuals' medical records [CW, June 28] are outrageous, but somehow not surprising to those who have been following the privacy issue for many years.

The practice of obtaining medical records without authorization for use in forcing settlement of insurance claims in a manner that benefits the insurance company has been going on for at least 25 years, according to Denver District Attorney Dale Tooley.

For the 56 firms named to date, disclosure of this illegal activity and the subsequent indictments are overdue.

Since no federal or Colorado law is in effect at this time to protect personal information maintained by hospitals, doctors and insurance companies, the grand jury was forced to charge conspiracy, impersonation and theft of trade secrets. Proving these charges may be a difficult task for the district attorney who must face the big guns of the insurance industry in court.

While no privacy law will guarantee citizens protection against subversive activity of the kind alleged here, such a law might be a deterrent if penalties for violations carry a higher cost than settling insurance claims honestly.

Further, a well-thought-out privacy law would make recordkeeping employees who provide personal information over the telephone without ascertaining the true identity of the caller as guilty as those who are actually subverting the system.

The work of the Denver district attorney in smoking out these abusers of personal privacy should be applauded.

Hopefully these indictments will be considered by the congressmen who must draft a privacy law to protect individuals against abuses from the private sector when the subject is considered again next year.

Unconvinced Consumers

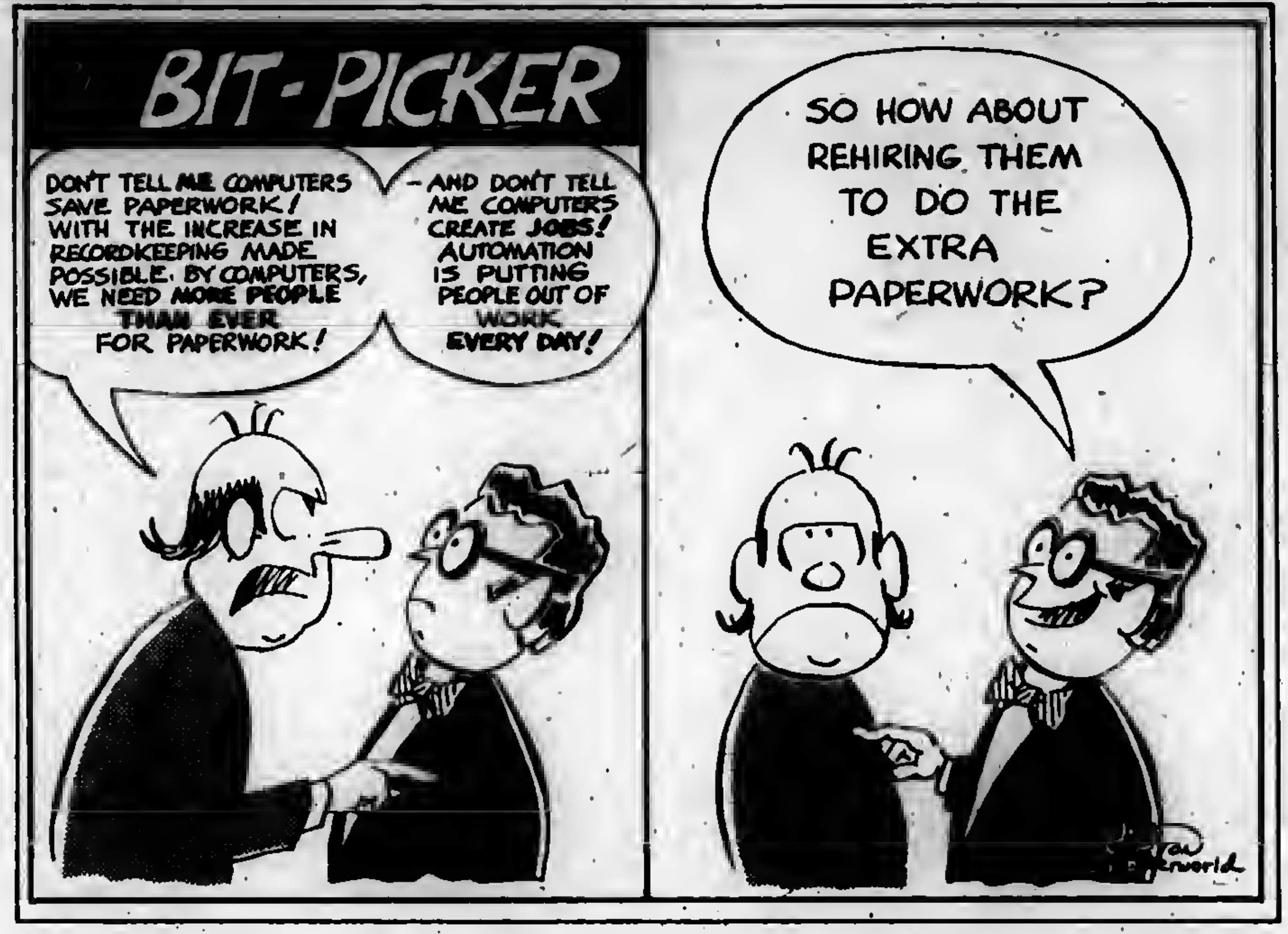
Consumer representatives from various sections of the country gathered recently in Cleveland to hear the telephone industry explain the Consumer Communications Reform Act of 1976 [CW, July 5].

The consumers were anxious to hear how they would be affected by competition fostered by recent Federal Communications Commission (FCC) decisions. Despite dire warnings about possible increases of up to 75% in residential phone bills which could not be substantiated with statistics, the consumers were not convinced the battle over specialized carriers and interconnection had any real impact on them.

There is a serious message far beyond this one meeting which failed to convince consumers. Many members of Congress have chosen to support the proposed legislation because they were led to believe it had a direct effect on the telephone bill of the voters back home.

It may well be the Consumer Communications Reform Act is really concerned with intra-industry problems that should be discussed and decided by the FCC. The Communications Act was created to set up a commission that would unburden Congress from having to decide each telecommunications problem.

AT&T and the telephone companies have lost every major attempt before the FCC to stop competition. Now they have hooked on to the consumer label in an attempt to involve lawmakers who want to impress their constituents. When will Ma Bell stop this folly?


BIT-PICKER
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SO HOW ABOUT REHIRING THEM TO DO THE EXTRA PAPERWORK?

Letters to the Editor

Articles on SSA DP Management Called Vague, Unauthoritative

The latest article [CW, June 21] in *Computerworld*'s soap opera serial of attacks on Social Security Administration (SSA) DP management has reached a new low.

The bits and pieces culled from the General Accounting Office (GAO) audit must leave CW's readers with doubts as to the veracity of CW's sources and questions on the gullibility of its staff.

The article was fraught with contradictions, oversimplifications and inappropriate accusations. How can CW state that none of the 17 large-scale IBM systems reached 50% capacity "even on its busiest days," yet refer to one complex (of four systems) as "extremely busy"?

How could it be beneficial to shuttle work between complexes, yet detrimental to move a tape to a medium-scale system for listing?

And how can CW accuse the administration of old-fashioned "Second-Generation" thinking, then rail against its attempts at progress?

No reference was made to any of the variables which can affect computer utilization other than stopping the systems to change shifts. Certainly changing shifts cannot be the major cause of underutilization.

Comments from the GAO audit indicated the auditors were on a predetermined witch-hunt, made little attempt to examine the "whys" of the system and displayed an unprofessional lack of knowledge of contributing DP factors.

The reference to listing tapes on medium-scale systems as being "totally unnecessary" certainly was a cheap shot. In the first place listing output tapes represents a small portion of the total CPU time expended, so why blow it out of proportion?

Secondly, many of the tapes require special forms and priority handling.

The audit's attack on dedicated complexes and "no sharing of work" between them failed to indicate the hardware/software restraints causing the situation. The mix being processed by the systems consists of a few important major job series and many less urgent secondary series.

Each major series with its associated catalogued procedures and catalogued data sets can only be efficiently processed on one complex.

Like the GAO auditors, I too do not have all the facts. So this letter must be vague, incomplete and unauthoritative. However, I hope CW's articles will cease to be likewise.

George Towner
Computer Specialist
SSA
Baltimore, Md.

Data Past

Five Years Ago
July 14, 1971

WASHINGTON, D.C. – The Federal Bureau of Investigation's (FBI) National Crime Information Center (NCIC) won what appeared to be its first legal test when its use in a stolen car case was questioned by the defendant. The court's decision indicated a car detained at a police station after a traffic arrest could be searched without a warrant, if NCIC reported the vehicle was stolen.

– – –

WALTHAM, Mass. – Honeywell, Inc. brought out its competitor for the IBM 3 in the Model 105. The $1,700/mo system filled the gap between Honeywell's models 58 and 115, was disk-oriented with Cobol and Fortran as well as having RPG available and came partially unbundled with 30 days of on-site support, 32 hours of testing and debugging, education at Honeywell sites and software, Honeywell said.

Eight Years Ago
July 10, 1968

WASHINGTON, D.C. – The Federal Communications Commission (FCC) ruled in the Carterfone Communications case that the foreign attachments tariff had been unlawful since its inception in 1957. The commission not only found the Carterfone to be a harmless attachment to the telephone network, but also ruled all such devices were harmless and threw out the entire tariff.

– – –

WASHINGTON, D.C. – Contract negotiations for the 1968-1969 U.S. General Services Administration (GSA) time period stalled here when GSA demanded pricing discounts from suppliers of computer equipment and software and also that the suppliers stand by the facts and figures given to GSA.

Tools Aid Debugging

I read and enjoyed both the article by B.H. Boar concerning the use of dumps to debug programs [CW, April 26] and the letter from Lee Milligan [CW, June 7].

When we started our current project, we installed two valuable debugging aids:

- TRACE
- ABEND RECOVERY WITH SNAP DUMPS

The abend recovery with an eight-link dump points directly at the errant instruction. We use this feature in production so we do not burn any midnight oil correcting production problems. Our programs are BAL and are on-line multitasking.

If we find we need a full dump, we indicate that in our JCL. The only time we have needed full dumps was to correct software problems.

Paul Tedesco
Blue Cross/Blue Shield
Systems Support/Claims Adjudication
Chicago, Ill.

S.P.I.E.

Just as I was rather deeply embarrassed not to have heard of the enormous computer hobbyist movement until just the other day, so I am embarrassed not to have heard until now of the S.P.I.E., the Society of Photo-Optical Instrumentation Engineers, headquartered in Southern California; You see, I was once an optical engineer, during World War II (repeat, II!), and attended meetings, heard and gave papers, and in fact worked up to national program chairman of the Optical Society of America. I dropped out in the early Fifties, but switched off my hearing aid completely only three or four years ago.

This new bunch has taken over a fair part of the more exotic optical work. The theoretical optics people (corresponding to computer science in our field), the spectroscopists and physiological optics researchers, all adhere to the OSA, but the laser boys, the lens designers, and especially the chip and chip mask "artists," are served by this novel organization. S.P.I.E. runs a series of seminar-meetings in each of its subject areas, and the latest was "Developments in Semiconductor Microlithography," in San Jose June 1-3.

When I registered, I found that there had been a previous session, "Advances in Photofabrication Imagery," in San Diego two years ago – and I got a copy of the proceedings, so I am at least catching up!

There was a small but extremely technical exhibit, mostly of inspection and measuring devices in LSI inspection and mask production. And at the San Jose gathering, there was a banquet speech on the Viking mission to Mars; and the life detection experiments aboard (heavily microprocessor controlled).

I was particularly interested in papers by IBM engineers on fine-detail mask requirements, with "error budgets" dividing the six or more sources of imprecision so as to achieve overall accuracy of 0.5 micrometer (formerly named "micron," or one-thousandth of a millimeter) – that's one-fifth of one ten-thousandth of an inch, about the wavelength of light. Most of the slides were of SEM (scanning electron microscope) results: even *production* chips are getting down below what we can clearly see with an optical microscope! While not explicitly identified, the ones described might well be the ones in the new IBM 5100, which is the current leader industry-wide in fineness of detail.

This was followed by a Texas Instruments thingy on submicron X-ray mask and chip production, but by research people who didn't really have much to sell. The last paper of the session, however, was by the top technicker from an outfit called E-Tech, which is building and selling very advanced electron beam mask cutting equipment, the fanciest units being in the $1.5 million dollar range. So Dr. Yew was very hot to trot, and trotted well.

Most readers would not be as fascinated by the technology as I was, but everyone who wonders what the fifth and sixth generation of data processors will be made of, and how much they will cost, has some stake in this latest advance. E-Tech and its competitors hope to carve the *masks* for say, 16K chips at the rate of one full 3-inch wafer surface every ten minutes. That's more than a hundred identical masks; ten or more *different* masks are currently required to make one sexy chip, and the number of layers is going up slowly but steadily.

This is the *one* beam, finer than even a very narrow laser – finer than a needle point. Now, if masks can be made competitively that way with one cutting beam, imagine the economics with a hundred, or some day ten thousand, parallel cutting beams. No more masks, of course; they'll cut the chips directly. The chip patterns will be far finer and more complex than today – a whole 370 CPU on a single "device" – but the masks, if photographic reproduction were not ruled out by the coarseness of even ultraviolet light, would of course also be equally complicated.

This is how a philosopher, an overviewer like me, can make judgments about highly technical futures without really mastering the technology itself. I can be nearly one hundred percent sure that masks and photo replication will disappear, that chips will be carved directly (the multilayer nature of the device is of course a very tough problem, but materials research always comes through!), and that hundreds of thousands, even millions of elements per chip can be achieved.

It is interesting to compare the papers I describe above with the printed proceedings of the earlier conference. Only two years later – 21 months, in fact – but the tone is already different. In the 1974 papers, the research and the inspection tools were optical, for the most part. Electron micrographs of sample chip areas were common, to show fine detail unobtainable with a light microscope – but only one paper, the last in the book, mentions election beam "fabrication." The small company concerned, Radiant Energy Systems, had some estimates of mask cutting that must have been startling even to the experts, in 1974. The 1976 meeting appeared to confirm the physical estimates (resolution under 1.0 micrometer, accuracy better than 0.25 micrometer), and the E-Tech 1976 economic promises were considerably better than the RES hopes of 1974 (10 minutes per 3-inch master, versus "less than an hour" for a 2.5 inch).

That sounds to me like real progress: a production machine; economics ahead of schedule (I think; dollar figures are missing in 1974, but the machine *looks* expensive in a laboratoryish sort of way); no new problems publicly stated or heard around the luncheon table; larger session attendance; and questions from factory engineers rather than physicists. Yes, the next generation is coming. Hi ho, Electron Beam!

Herb Grosch

BankAmericard Descriptive Billing Now Hitting Mark

By Alan Taylor
Of the CW Staff

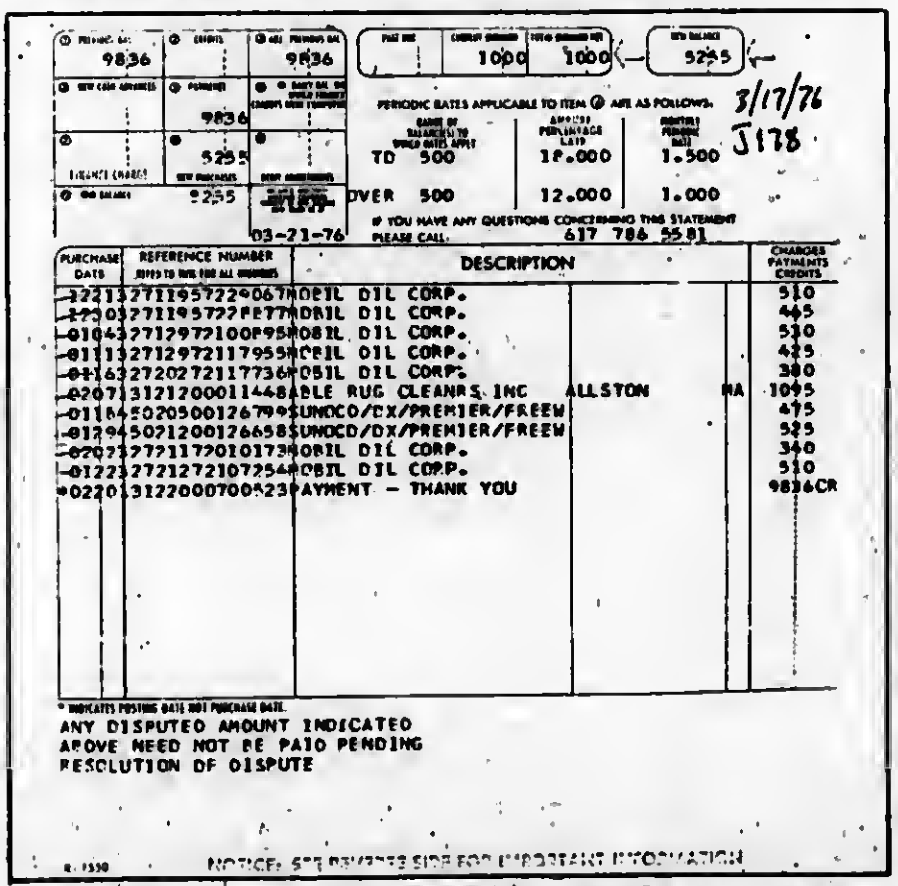
The State Street Bank in Boston has come out with a new BankAmericard descriptive billing statement which is very different – and much better – than the one described here recently [CW, Feb. 9]. After a number of internal delays, it was put into operation in May and has attracted a number of pro and con comments.

The form (Figure 2) does show a very different approach to providing information to the user than the earlier one did (Figure 1), and to my way of thinking it is very much better.

The differences between the two forms fall into two areas – those parts that have been changed and those that have been added. There are three areas that have been added to the form – a billing day count, a summary debits and credits totals line and specific posting dates.

The billing day count is needed because of the use of an "average

(Continued on Page 16)



9836 | 9836 | 9836 | 5255 | 5255

1000 | 1000 | 5255

3/17/76
J178

PERIODIC RATES APPLICABLE TO ITEM ⑦ ARE AS FOLLOWS:

TO 500	18.000	1.500
OVER 500	12.000	1.000

03-21-76

IF YOU HAVE ANY QUESTIONS CONCERNING THIS STATEMENT PLEASE CALL. 617 786 5581

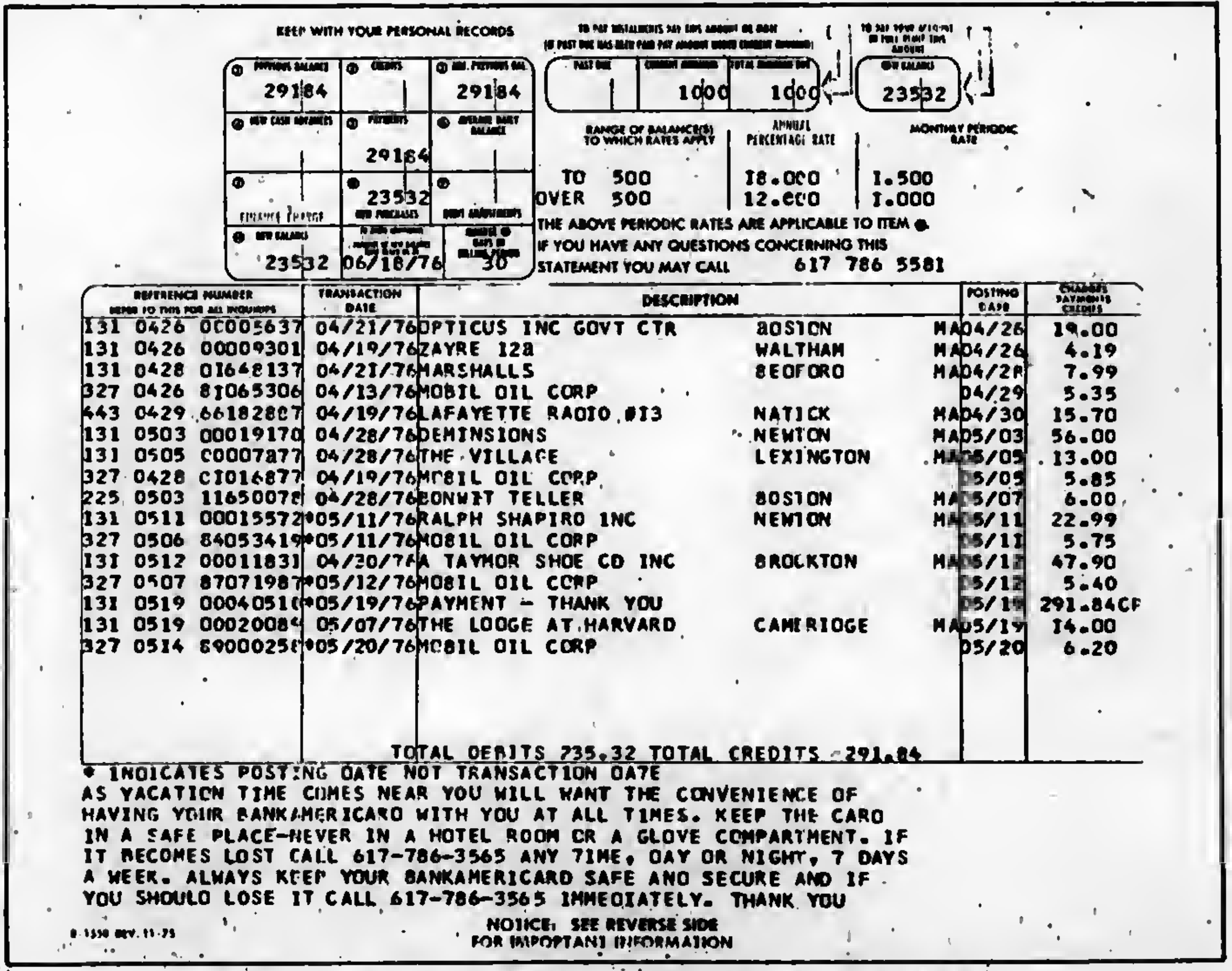
PURCHASE DATE	REFERENCE NUMBER	DESCRIPTION			CHARGES PAYMENTS CREDITS
1221	3271195722906	MOBIL OIL CORP.			510
1230	327119572?FE77	MOBIL OIL CORP.			445
0104	32712972100F95	MOBIL OIL CORP.			510
0111	32712972117955	MOBIL OIL CORP.			425
0116	32720272117736	MOBIL OIL CORP.			380
0207	3121200011448	ABLE RUG CLEANRS INC	ALLSTON	MA	1095
0116	45020500126799	SUNOCO/DX/PREMIER/FREEW			475
0129	45071200126658	SUNOCO/DX/PREMIER/FREEW			525
0207	37721172010173	MOBIL OIL CORP.			340
0122	37721272107254	MOBIL OIL CORP.			510
*0220	31220007005?23	PAYMENT – THANK YOU			9836CR

* INDICATES POSTING DATE NOT PURCHASE DATE.

ANY DISPUTED AMOUNT INDICATED
ABOVE NEED NOT BE PAID PENDING
RESOLUTION OF DISPUTE

8-1550 NOTICE: SEE REVERSE SIDE FOR IMPORTANT INFORMATION

Figure 1. An example of BankAmericard's old-style billing.



KEEP WITH YOUR PERSONAL RECORDS

① PREVIOUS BALANCE 291.84	② CREDITS	③ ADJ. PREVIOUS BAL. 291.84
④ NEW CASH ADVANCES	⑤ PAYMENTS 291.84	⑥ AVERAGE DAILY BALANCE
⑦ FINANCE CHARGE	⑧ NEW PURCHASES 235.32	⑨ DEBIT ADJUSTMENTS
⑩ NEW BALANCE 235.32	06/18/76	30

PAST DUE	CURRENT AMOUNT	TOTAL AMOUNT DUE	NEW BALANCE
	10.00	10.00	235.32

RANGE OF BALANCE(S) TO WHICH RATES APPLY	ANNUAL PERCENTAGE RATE	MONTHLY PERIODIC RATE
TO 500	18.000	1.500
OVER 500	12.000	1.000

THE ABOVE PERIODIC RATES ARE APPLICABLE TO ITEM ⑥.
IF YOU HAVE ANY QUESTIONS CONCERNING THIS
STATEMENT YOU MAY CALL 617 786 5581

REFERENCE NUMBER	TRANSACTION DATE	DESCRIPTION			POSTING DATE	CHARGES PAYMENTS CREDITS
131 0426 00005637	04/21/76	OPTICUS INC GOVT CTR	BOSTON	MA	04/26	19.00
131 0426 00009301	04/19/76	ZAYRE 128	WALTHAM	MA	04/26	4.19
131 0428 01648137	04/21/76	MARSHALLS	BEDFORD	MA	04/28	7.99
327 0426 81065306	04/13/76	MOBIL OIL CORP			04/29	5.35
443 0429 66182807	04/19/76	LAFAYETTE RADIO #13	NATICK	MA	04/30	15.70
131 0503 00019170	04/28/76	DEMINSIONS	NEWTON	MA	05/03	56.00
131 0505 00007877	04/28/76	THE VILLAGE	LEXINGTON	MA	05/05	13.00
327 0428 01016877	04/19/76	MOBIL OIL CORP			05/05	5.85
225 0503 11650078	04/28/76	BONWIT TELLER	BOSTON	MA	05/07	6.00
131 0511 00015572	*05/11/76	RALPH SHAPIRO INC	NEWTON	MA	05/11	22.99
327 0506 84053419	*05/11/76	MOBIL OIL CORP			05/11	5.75
131 0512 00011831	04/20/76	A TAYMOR SHOE CO INC	BROCKTON	MA	05/12	47.90
327 0507 87071987	*05/12/76	MOBIL OIL CORP			05/12	5.40
131 0519 00040510	*05/19/76	PAYMENT – THANK YOU			05/19	291.84CR
131 0519 00020084	05/07/76	THE LODGE AT HARVARD	CAMBRIDGE	MA	05/19	14.00
327 0514 69000250	*05/20/76	MOBIL OIL CORP			05/20	6.20

TOTAL DEBITS 235.32 TOTAL CREDITS 291.84

* INDICATES POSTING DATE NOT TRANSACTION DATE
AS VACATION TIME COMES NEAR YOU WILL WANT THE CONVENIENCE OF
HAVING YOUR BANKAMERICARD WITH YOU AT ALL TIMES. KEEP THE CARD
IN A SAFE PLACE–NEVER IN A HOTEL ROOM OR A GLOVE COMPARTMENT. IF
IT BECOMES LOST CALL 617-786-3565 ANY TIME, DAY OR NIGHT, 7 DAYS
A WEEK. ALWAYS KEEP YOUR BANKAMERICARD SAFE AND SECURE AND IF
YOU SHOULD LOSE IT CALL 617-786-3565 IMMEDIATELY. THANK YOU

8-1550 REV. 11-75

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Figure 2. An example of BankAmericard's new descriptive billing.

To match our terminal systems, you could deal with at least five different salesmen...

and still worry about service.

See us instead! We supply cost-effective terminals for every application, including these:

ATS–The Trendata® 4000, with its Selectric-style keyboard and 30 cps printer in an attractive console, provides 2741 compatibility plus higher performance. Computer-controlled margins, spacing, horizontal/vertical tabs, and pagination for fast, crisp forms printing.

APL–Our Model 4000 offers total compatibility with USASCII, Correspondence, and EBDIC code sets in this powerful timesharing mode. Typewriter paired keyboard has keytops engraved with APL characters for ease of data entry.

TSO–TTY 33/37 or IBM 2741 compatibility at the flick of a switch... 132 or 158 print positions, also switch selectable... typewriter-style keyboard with ANSI, Correspondence, or EBCD layout... all on our Model 4000.

TRENDwriter–Teletype-compatible 30 cps TRENDwriter with full 132 print positions is the ideal replacement for KSR teletypewriters. Matrix printer... full USASCII character set.

SELECTRIC–Rugged Model 1000 with acoustically insulated, heavy-duty I/O-type Selectric, plus conveniently grouped controls and status indicators, in a human-engineered work station compatible with systems using IBM 2741.

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Sunnyvale, CA 94086

BankAmericard Billing Seen Hitting the Mark

(Continued from Page 15)

daily balance" in the finance charge calculations. Customers wanting to check the average balance finance charge have to use the average daily balance. While the bank's opinion of what this is is given in Box 6, the careful customer may want to recompute it.

There is nothing on the statement which tells him the starting and ending date of the billing cycle – so billing day count is essential information which wasn't given previously.

So is the addition of specific "posting dates." As a matter of fact, I find this addition doubly acceptable. It gives information, and it helps understanding.

Not everyone with a credit card understands the delays that occur between purchases, credits and postings. As a matter of fact, not everybody understands the terms themselves. So the mere inclusion of the two different dates is educational in itself. That is a real improvement. Even if nothing else were provided by the entry, this would be a major step forward.

Something else is provided in this case. The posting date permits the balance information to be worked out – again a necessary operation for anyone checking the finance charges. Previously the posting date was not provided unless the transaction date was missing, which prevented people from being able to check to actual daily balances.

The third area added is the total debits and credits line at the bottom of the transaction block. Although it can't be seen from the example shown, this does total all debits and all credits except the finance charge data.

Got the Point

The changed fields, however, are getting somewhere near perfect. State Street/BankAmericard has clearly got the point that data has to be readable. In place of the old, cramped, misaligned and hard-to-read entries, there are reference numbers in three intelligible groupings, dates with years included, slash separators and decimal points separating dollars and cents.

They have also added a separator between the merchant identity field and the location field, although since the identities in this example have not been expanded to take up the newly expanded field space, there is no way of seeing this as yet.

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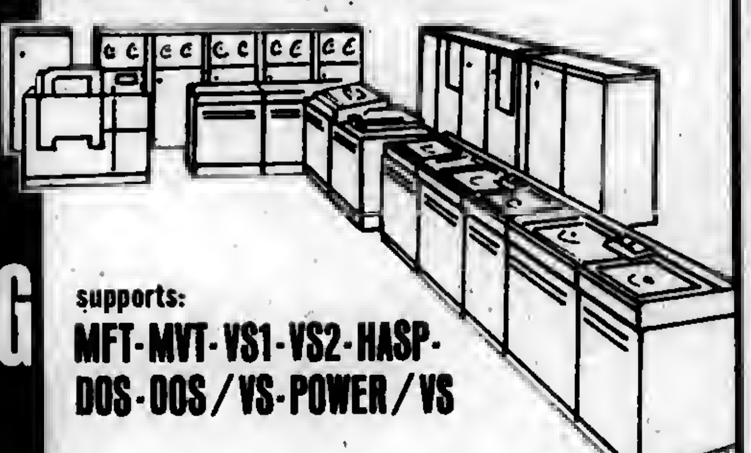

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Packaged Service Called Real Alternative to Mini

By Don Leavitt
Of the CW Staff

WELLESLEY, Mass. – Keydata Corp. has announced a packaged time-sharing service to provide small businesses with a "low-cost, risk-free alternative to the minicomputer," according to a spokesman.

Designed for distribution and manufacturing companies in the $750,000 to $5 million annual sales category, the service is called System 800 because it offers specific applications – billing, inventory control, accounts receivable and sales analysis – as well as a variety of monthly and quarterly management reports for $800/mo on a one-year contract.

The vendor uses a unit of measurement called a Keydata Resource Unit (KRU) which consists of four factors – number of customer invoices, average number of invoice lines, number of customer records and number of item records – to determine if a company's processing requirements can be met for the $800/mo price.

Most companies with annual sales in the $750,000 to $2 million range will fit within the formula; companies with annual sales up to $5 million whose requirements only exceed the formula by a small amount will be offered the option of paying an additional $4.75/mo for each 1,000 KRUs in excess of the 175,000 included in the basic monthly price, the spokesman noted.

System 800 service includes:

- Use of a General Electric Terminet 300 in the user's office and maintenance of that terminal for the life of the contract.
- Performance of billing, inventory control, accounts receivable and sales analysis on-line with 2 sec response.
- On-line access to Keydata's computer center in Foxboro, Mass., 14 hours a day, five days a week and 10 hours on Saturday.
- Access to the Keydata computers through the company's nationwide data communications network.
- The ability to link up to three locations to the company's central data base.
- Six monthly management reports and two quarterly reports.

The reports include a monthly customer activity analysis, monthly stock status/item sales analysis, quarterly updated customer list and quarterly item list plus a choice of four of the following six monthly accounting reports: invoice and credit memo register, tax register, a commission report, a transaction register, an open item aged trial balance and monthly customer statements.

Cost of the private communications links between user sites and Keydata's data center or multiplexers is borne by the user under System 800. This would typically amount to an extra $35- to $50/mo, Keydata estimated.

In addition to a monthly packaged price for the service, Keydata is offering fixed-price data conversion and start-up support for $2,500.

The firm is at 20 William St., Wellesley Office Park, Wellesley, Mass. 02181.

DEC Adapts IDMS to Run on PDP-11/70

MAYNARD, Mass. – Based on IDMS, Cullinane Corp.'s data base management system, DBMS-11, has been introduced by Digital Equipment Corp. for use on PDP-11/70s running under the Interactive Application System (IAS) control software.

At the same time, DEC also announced RMS, which it described as a multikeyed indexed data access function for use under Resource Sharing/Time-Sharing (RSTS/E) on the PDP-11/34, -45 and -70 computers.

Sticking as close to IDMS as possible, the developers of DBMS-11 had to make changes to accommodate the change in word size from the IBM 360, on which the Cullinane package had been created, to the DEC hardware.

Aside from that, the DEC implementation also included some of the data manipulation language specifications in the *1975 Codasyl Cobol Journal of Development* that simply did not exist when IDMS was first put together, DEC said.

Cullinane is also implementing these changes in IDMS, a DEC spokesman noted.

Less Than 1% Change

DBMS-11 represents "less than a 1% change from IDMS," he said. However the products may not stay that close in future. DEC expects to create "a full line of data base products" for use across the PDP-11/Decsystem-20 range, he explained, and that may mean DEC has different purposes for DBMS-11 than Cullinane has for IDMS.

Although DBMS-11 is currently limited to IAS environments, he noted the company "certainly expects to migrate the system" to other operating systems as well.

RMS-11 was created in-house by DEC and is said to support the features of ANS Cobol '74 Level 2 Indexed I/O module specifications, providing the user a multikeyed Isam facility. Its logic allows sequential, relative and indexed file organizations and that, in turn, supports sequential, random and direct physical data access, the vendor claimed.

"Dynamic" access – allowing a combination of access modes – is also supported, DEC said. RMS-11 backs the use of fixed- and variable-length records, includes multilevel privacy control and provides generic and approximate key searches, the spokesman continued.

Although DEC has configured a hardware/software package (called the 11B/70) to utilize the DBMS-11 facilities, the data base software is also available separately for $15,000, the spokesman noted.

RMS-11 is licensed for $2,500 as an option to RSTS/E and can run on any configuration that supports that operating system, DEC said.

Data General Cobol Validated; Most 'Errors' Considered Minor

WASHINGTON, D.C. – The Cobol compiler developed by Data General Corp. for use with its Eclipse C-300 computer stood up well in an audit conducted by the Federal Cobol Compiler Testing Service (FCCTS), a summary report of the results indicated.

Limited to evaluating compliance with Federal Information Processing Standards for the so-called Low-Intermediate implementation of the 1974 American National Standards Institute (Ansi) specifications, the audit routines identified 11 situations as error conditions.

In general, the error flags neither surprised nor disturbed Data General. In several instances, the "errors" referred to facilities the vendor did not choose to implement within Cobol – the Debug module, for example – because it felt it already had a better facility outside the language, a spokesman said.

In other situations – notably the Nucleus' inability to handle COMPUTATIONAL data items longer than 16 digits in accordance with the Ansi "rules" – the problem goes back to machine architecture. Data General has no reasonable means of changing that to comply with the federal audit routines, he added.

'Not Real Errors'

A series of five conditions identified as errors within the Relative I/O module are seen by Data General as the most serious of all the items noted by the FCCTS, "but even these aren't real errors in view of the way we implemented that module," the spokesman contended.

While the vendor would be expected to see the results positively, other observers appear impressed with the Data General results. "It's the closest I've seen to compliance with the '74 specifications, on a small machine," according to one outside source.

The Validation Summary Report for the Data General computer is expected to be ready for distribution in the next several weeks, through the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

Infonet Adds Econometrics Tool

EL SEGUNDO, Calif. – Time Series Processor (TSP), a statistical analysis program used in econometrics research, is now available on Infonet, Computer Sciences Corp. (CSC) international remote computing service. Originally developed at MIT and Harvard University and enhanced by CSC, the program now operates in both conversational and remote batch modes.

TSP's preprogrammed functions cover the computational steps that normally occur in econometrics research, including regression and simulation procedures, matrix operations and series generators. Miscellaneous procedures available through TSP include actual and predicted series comparision, analysis of estimated parameters, covariance and correlation analyses, divisia index procedure and principal components analysis, a spokesman said.

TSP also operates as a programming language, enabling the analyst to structure his own program with as complex a branching logic as he desires and to create a data base to store and update statistical information. Data base maintenance is flexible since TSP allows both fixed and free format input, the company noted.

CSC is headquartered at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

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Set For December Start

Service Planned to Poll On-Site Monitors

RESTON, Va. – The Performance Monitoring Network (Permonet) service from CACI-Performance Services is being designed to provide hardware monitoring and analysis at less cost than if users tried to do the work themselves, CACI said.

Aiming to help the medium-scale and smaller installation, Permonet – now expected to go into operation in December – will include installation of a monitor at the user site, remote collection and computer-generated analysis of the performance data and periodic on-site review by a CACI analyst, the vendor explained.

The monitors to be used will "probably be Tesdata MS32-type" units and they will normally be polled every eight hours by CACI's CPU, a spokesman continued.

Real-time reports will be generated, however, whenever the monitor recognizes user-defined performance thresholds have been passed, he said.

Daily, weekly, monthly and quarterly reports will provide analyses of actual operations and trending patterns from longer perspectives. Though CACI personnel typically will visit user sites only quarterly, they will review each client's data daily, the spokesman added.

Permonet facilities are viewed by CACI as a logical first step in performance measurement and management for "any DP installation" and as a complete capability for sites of moderate proportions. They may also serve to supplement efforts already started by large-scale DP operations.

Since the monitors will be purchased in bulk by CACI before redistribution to user sites, the unit cost will be lower than it would be for the individual buyer. Other cost savings will occur, CACI said, because the user will not need a performance analyst on his staff.

Permonet is being sold on a one-year subscription basis for $3,000/mo with a discount to users who subscribe before Sept. 30. CACI-Performance Services is at 1920 Association Drive, Reston, Va. 22091.

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MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will ba received by the CDPA, 508 Robert E. Lee Bldg., Jackson, MS, 39202, up until 2:00 p.m. 7-26-76 for tha following data processing equipment:

Request for Proposal No. 249 for tha purchase of an 8K memory upgrade, a link diskatte, and a floating point processor to intarface with an existing Artronix PC-12/730 madical systam.

Request for Proposal No. 250 for the laase or purchase of softwara to maintain and provide raports from water well racord data accumulatad by the U.S. Gaological Survey.

Request for Proposal No. 251 for the laase or purchase of a micro-processor capabla of asynchronous communications with an axisting Xerox Sigma 9 computer system.

Request for Proposal No. 252 for tha lease or purchase of an easy to use raport ganerator typa language to run on a 370/155 system and to be used by non-tachnical personnel.

Detailed specifications may be obtainad from tha CDPA office. The CDPA raserves the right to raject any and all bids and proposals and to waive informalitias. Clyde P. Baltard, Exacutiva Diractor, Cantral Data Processing Authority.

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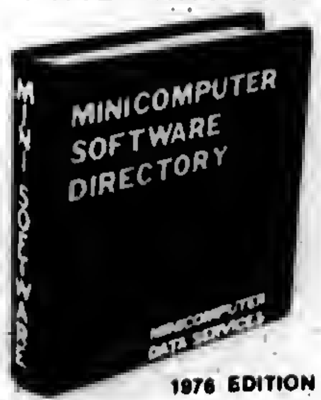

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'Decs' Uses 3270 in Data Entry

RICHMOND, Va. – The Data Entry Control System (Decs) from The Computer Software Co. is an on-line keypunch replacement which provides IBM 3270 CRT support for data entry and verification and remote job initiation to IBM 360/370 CPUs, the vendor said.

Existing application programs can be used without change since output from Decs can be formatted to match the input requirements of the processing runs, according to the company.

Job control statements designating card input would have to be modified, a spokesman acknowledged.

No Need for Monitor

The software supports both local and remote 370s, functions as a "stand-alone" system and does not require the use of a teleprocessing monitor such as IBM CICS, he said. Decs can be used under DOS, DOS/VS or Computer Software's Extended DOS (Edos), he added.

While support for concurrent keying and verification of data is one of the major operator-oriented features of the system, on-line training and prompting facilities are also important, the vendor said. So is the ability to accumulate and display batch totals on numeric fields, it added.

On another level, backing for automatic restart/recovery is also part of Decs, as is – for Edos users – interactive interfacing with that operating system's procedure library and Extended Spooling Facility, the spokesman noted.

Decs requires 24K bytes of main memory and is available for $5,500 or $140/mo from the company at 6517 Everglades Drive, Richmond, Va. 23225.

'Inquire' Enhancements Speed Data Base Chores

FALLS CHURCH, Va. – IBM 360/370 installations working with Inquire from Infodata Systems, Inc. have reduced CPU time and dollar costs for many operations by as much as 85% as a result of recent enhancements to the data base mangement system, according to vendor claims.

Release 8-1, recently shipped to current users, reduces both CPU time and memory requirements for the English-like command language portion of the system, a spokesman noted.

The command language provides rapid searching with multiple keys as well as data manipulation and reporting facilities, he said.

Inquire was earlier enhanced by the addition of a Procedural Language Interface (PLI) which allows programs written in the user's normal host language – Assembler, Cobol, Fortran or PL/1 – to access Inquire data bases.

This feature can be utilized in a multithread, high-volume transaction-oriented processing environment, Infodata said.

This spring the vendor revised the way the system allows the user to change keys or indexes. Now based on field change transactions, this has reduced the cost of this type of operation by 85%, the company said.

The full Inquire system requires a minimum of 130K bytes of main storage, but more typically utilizes 150K to 200K; it functions under either OS or OS/VS.

The basic system, made up of the command language processor and utilities, costs $39,500. The complete system with PL/I costs $80,000, Infodata said from 5205 Leesburg Pike, Falls Church, Va. 22041.

AMA Publishes Software Handbook

NEW YORK – Amacom, a division of the American Management Associations (AMA), has published the *Handbook of Data Processing Administration, Operations and Procedures* by S.R. Mixon.

Described as a guide to solving the problems inherent in software development, operations and maintenance, the book can speed up the system development process 15% to 30% and reduce maintenance costs through a common design philosophy and standard documentation, Amacom claimed.

The nearly 400 pages give management tools for controlling projects and provide "guidelines for ANS Cobol, modular programming, standardized program coding, automated documentation, creation of the data element dictionary and much more," according to the AMA.

The handbook has been structured and written for use by readers with varying degrees of DP experience, a spokesman added. The five sections include an overview and detailed project management methods, design standards, documentation standards and Cobol standards, he said.

The handbook can be ordered for $24.95 from the AMA at 135 W. 50th St., New York, N.Y. 10020.

'Best' Condenses Data for IBM 3

SILVER SPRING, Md. – By condensing and later restoring data, the Bit Efficient Storage Technique (Best) package from Standard Software Co. is said to reduce the storage needs of IBM 3 users, but still allow them to access data at the field level.

Condensing differs from compressing data, the vendor said, noting Best reduces fixed-length fields to smaller but still fixed-length fields so start points can be identified.

Best is used at the application program level and can be applied field by field, the firm said.

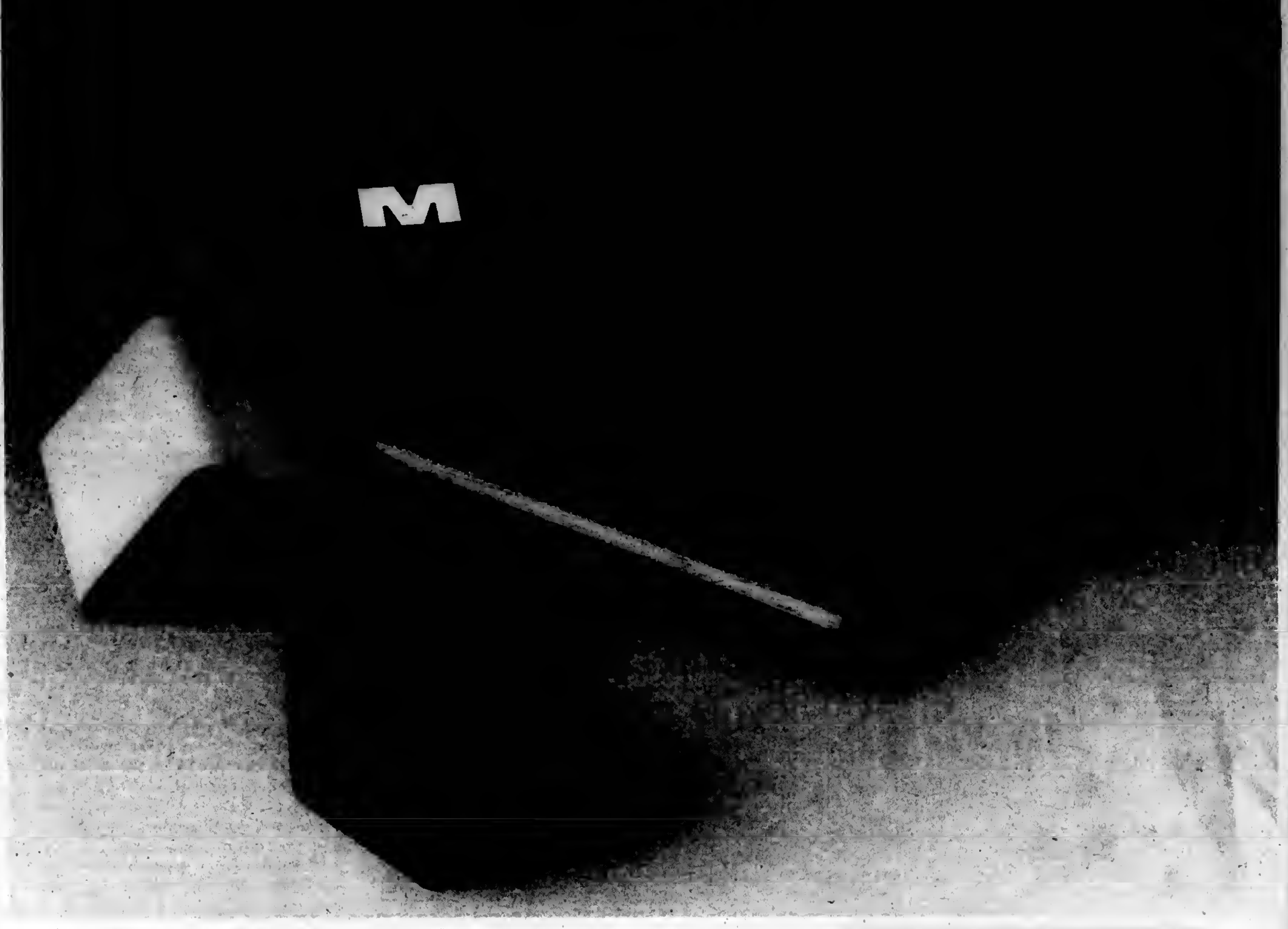
Available in object code on 96-column cards or on user-supplied diskette or disk, the software costs $1,440 or $30/mo and can be ordered from Standard through P.O. Box 1434, Silver Spring, Md. 20902.

Name Changed

CUPERTINO, Calif. – Measurex Corp. has changed the name of its family of product throughput control systems from "System 2000" to "Measurex 2000."

The name "System 2000" was used by MRI Systems Corp. prior to Measurex's use of it, and the change was made to prevent confusion in the industries served by both companies, a Measurex spokesman noted from One Results Way, Cupertino, Calif. 95014.

In data entry and communications, making The Intelligent Choice is as simple as M-D-S.



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MDS System2300. The System 2300 is an intelligent terminal offering computer-compatible data capture, simultaneous with Document Processing at the source. The 2300 is also capable of RJE Communications.

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Both this model and the Model 148 feature a standard 1,920-character display console and keyboard for swift, effective communication with the system.

In addition to peripheral printers, one or two 3203 Model 4 Printers can be attached directly to the 148 or 138. The new 3203 is rated at 1200 lines per minute.

JUNE 30, 1976

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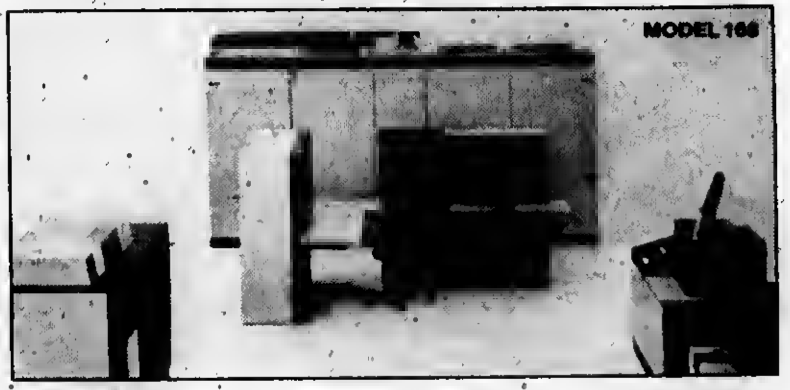

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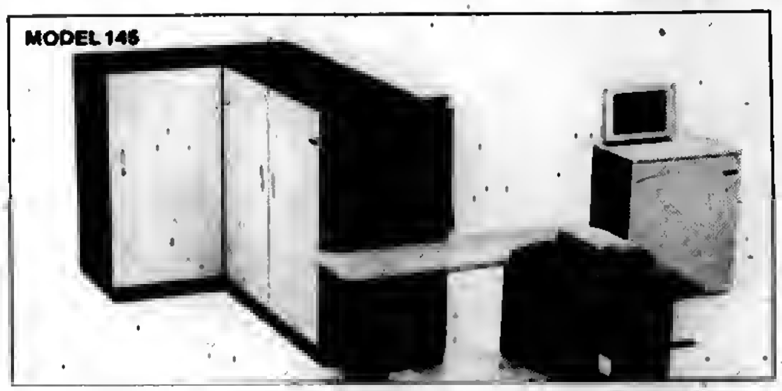

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Since it was introduced, the IBM System/370 has been a dynamic, evolving computer line—in terms of the computers themselves, their operating systems and input/output devices. Now System/370 again sets new levels of performance and efficiency with the introduction of two more virtual storage computers, the Models 138 and 148.

The new computers can provide the power to expand data base and communications capabilities. They can aid a move into the productive environment of interactive computing. They can mean adding a range of business-building applications that may have been deferred for lack of capacity.

More work at lower cost

Both new models provide clear-cut evidence of the continuing advances in technology behind the System/370. For growth-minded users, this translates into the solid advantages of more work accomplished at a lower cost.

In support of such progress, the Model 148 offers a main storage up to twice as large as that now used by most 145 users. The 138 has double the maximum storage of the 135. Internal performance of both models is significantly faster than that of their predecessors—the 148 offers up to 43% improvement, the 138 up to a 36% gain.

Numerous other advances lead to increased operating efficiency. A new Hardware Performance Assist gives VS 1 and Virtual Machine/370 users an additional performance boost. A greatly enlarged control storage allows for concurrent use of standard and optional features, eliminating configuration tradeoffs. And many previously optional features are standard with the Models 138 and 148.

Substantial price/performance gains over the 135 and 145 are thus made possible with the new models. With them, the "intermediate" system takes on many of the characteristics of powerful, large-scale computing.

For more information on the Models 138 and 148, call your IBM Data Processing Division marketing representative. Or write to the IBM Corporation, Dept. 83F, 1133 Westchester Avenue, White Plains, N.Y. 10604.

IBM®
Data Processing Division

'Solis' Manages Bank Queries, Tracks Related Accounts Data

DALLAS – National Sharedata Corp., which performs facilities management services for banks, has announced a service developed to provide on-line processing, reporting and maintenance of a bank's customer banking activities.

The Sharedata On-Line Information Systems (Solis) reportedly provides capabilities for three basic bank applications: account inquiry, customer cross-relation information and data capture at the source.

Solis integrates these applications so a bank has fast access to information on all customer accounts and the services it provides to each through a centralized data file, National Sharedata said.

The system is modular so it can utilize a bank's basic accounting system as a foundation for the bank's future asset, financial and executive management systems, as well as for electronic funds transfer (EFT) systems, according to a spokesman.

Several National Sharedata clients have begun using expanded capabilities of Solis to introduce EFT systems, he noted. One bank client has developed a check guarantee system and is now planning a point-of-sale system; another is developing a point-of-sale system; and a third has developed an automated teller installation.

Bank services handled within Solis are said to include demand deposits, savings, certificates of deposits, installment loans and commercial loans.

To access the data file, personnel can make entries and inquiries or update information at any time by using telephone audio-visual display and hard-copy terminals linked to the bank's central computer facility; the terminals are located at teller stations and other key points in the bank, the spokesman said.

Solis was designed so detailed account information is furnished at the bank's operational levels, customer status information is available at the bank customer level and key management information is consolidated and presented to executive management for financial planning and control, according to the vendor.

Available without additional cost to current National Sharedata clients, Solis can be installed at a new user's site subject to negotiated price, the vendor said from 800 One Main Place, Dallas, Texas 75250.

'Opsys 1' Drives CA Minis

BELMONT, Calif. – Opsys 1 from Systems Pro Tem is a disk operating system designed to support both program development and productive operations in batch mode on Computer Automation, Inc. (CA) 16-bit minicomputers, including the 2/05 "Millicomputer."

An assembler is included along with a free syntax text editor suitable for maintaining source programs for the assembler, the vendor noted.

Opsys 1 is said to have a sophisticated job control capability which enables the user to invoke a complex series of tasks with a single command.

The software has named files complete with volume ID and extension, which is used in intrinsic file typing, the vendor said. More than 100 files per disk can be defined and the system can communicate with more than one type of disk simultaneously, a spokeswoman added.

Supporting one to four disks, Opsys 1 includes device independency so a user may freely assign I/O devices without program modification.

All files have library capability; absolute and relocatable load files may exist anywhere on a disk, she noted.

Dynamic buffer allocation provided by the system "means the user has more memory for his program," she said. Buffers are set up at execution time from the top of memory and overlay the loader; they are relinquished as files are closed.

Modular in design so only those features that are desired need be present, the entire Opsys 1 fits in less than 3.5K of memory, the vendor said.

The system, on paper tape or diskette, is available now for $700 from Systems Pro Tem, 3206 E. Laurel Creek Road, Belmont, Calif. 94002.

Developer Seeking Bank as Test Site

WEST CHESTER, Pa. – Data Base Systems, Inc. said it has completed the design of an on-line bank deposit system with electronic funds transfer (EFT) features and is now seeking a bank with the necessary hardware/software configuration to serve as a development site.

Clearly IBM-oriented, the package utilizes "current versions" of IMS and CICS, according to its description, which referred presumably to VS implementations of those systems.

Three phases of development have been scheduled: an independent batch system, to be complete by July 1, 1977; administrative teleprocessing, by Nov. 30, 1977; and EFT automated station/teller teleprocessing, by April 28, 1978.

When complete, the package is expected to handle demand deposit accounts, regular and restricted savings accounts, clubs and pensions. It will be based on a descriptive "unistatement" showing activity and status of all accounts for each bank customer.

The system will permit automatic interaccount transfers, preauthorized payments and entries from automated clearinghouses as well as more conventional banking transactions, a spokesman explained.

The designers ultimately expect to support entries from automated teller machines and point-of-sale units in merchant locations. The package also will manage stop-payment and "hold" messages, the company said.

Management will be aided through related account analysis, earnings/account profitability studies and a parameter-driven report generator.

The company has not yet estimated what the complete system or any of its parts – assuming it will be modular – will cost. It noted, however, that any bank with which it works will be able to acquire the system for a "significantly reduced fee."

Data Base Systems, Inc. is in the Darlington Building, West Chester Plaza, West Chester, Pa. 19380.

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Software Cooperative Endangers Users' Market Edge

By Lewis L. Copley Jr.

Special to Computerworld

In "Cooperative Development of Software Seen Better Than Current Approaches" [CW, June 14], Constable painted an amazing collage of illogic based upon inaccurate assumptions and factitious examples.

Concepts and Techniques

His statement that "as fast as the hardware dollar buys more, the software dollar buys less . . . and less" was both technically incorrect and historically inaccurate. In the first instance, the statement assumed a proportional relationship where none exists; in the second instance, today's software dollar buys more than it did seven years ago (let alone 10 to 15 years ago).

Examine the facts. It is acknowledged that today's hardware dollar buys more because of improved technology, manufacturing, marketing and distribution. In 1969 a 12K IBM 1406 with one 2.5M-byte disk, one printer, one reader/punch and four tape drives cost $409,000.

In 1976 a 16K multiprocessing system with two remote CRT workstations, one 5M-byte disk, one reader, one printer, one diskette and four cassette drives can be purchased for $55,000. Comparative performance to characteristics and capabilities indicate the latter system is three to five times the machine the 1406 was.

Spirit of 96%

In this example (albeit extreme), the cost of hardware decreased 96% over a seven-year period. Does software cost that much more in 1976? Could it be that, because software costs have decreased, software merely occupies a larger proportion of the DP budget?

"No" in response to the first question; "yes" in response to the second. The cost of software is mainly attributable to two factors – salaries and time.

Depending upon the levels of expertise, DP salaries have increased 35% – 100% during the seven-year period of 1969-1976, with a 48% median. The majority of this increase can be laid at the doorstep of a double-digit, inflationary economy, the remainder to competitive salary practices.

However, during the same seven-year period, productivity aids (like on-line programming and interactive debugging) have dramatically reduced project development time (e.g., turnaround time has been reduced from days to minutes). Measurements have indicated 60% to 140% productivity increases.

Because the cost of software is derived from salary/time interaction, the net effect is that today's software dollar buys 12% to 66% more than it did just seven years ago.

To "look at the 10 largest banks, insurance companies, etc. [and] find that, apart from names and locations, their products and services are almost identical" – as Constable did – requires tunnel vision. This is a fallacy of composition similar to:

Mary likes trees.
A canary likes trees.
Therefore, Mary is a canary.

Cooperative Concept Doomed

To suggest that industry giants attain their stature via a program of mime is absurd. There are a number of reasons why the top 10 corporations in any industry reached that position, including strong leadership, sound investment policies and successful market strategies.

It is precisely these qualities that doom the cooperative software concept.

Contrary to what Constable might lead one to believe, a large corporation's software (aside from personnel/payroll, general accounting and purchasing/inventory, a mere 2% to 3% of total software) is specifically oriented to product/service or investments. What effect would cooperative development have on the corporation?

For a long time it has been acknowledged that new product/service lead-time in the marketplace can be extremely profitable. To offer a new product/service in the marketplace presupposes the existence of support for that product or service, including the requisite software. Cooperative development of this software would be tantamount to broadcasting corporate market strategy.

Likewise, an investment portfolio yielding 1% to 2% more than the industry average is not to be considered lightly.

Not a 'Luxury' Option

Anyone who sincerely believes the 10 largest corporations in an industry pass around investment practices and market strategy is terribly mistaken. The in-house development of software is not a "luxury for which large companies are willing to pay ad infinitum"; it is, rather, a very positive way of assuring a large corporation it can retain its top ranking.

The cooperative approach calls for the abdication of those corporations at the top to a state of mediocre unanimity.

"How do you convince people that cooperatively developed (and therefore, to some extent, standardized) business applications are viable?" Constable asked. I submit you cannot. The price is too high.

Where is the economy in saving $2 million in software development while losing $50 million to $100 million in the marketplace?

Copley is with the Computer Systems and Services Office, Prudential Insurance Co., Roseland, N.J.

Assembler Leaves Choice Of Host, Target to User

ATHENS, Ga. – Described as a cross-assembler with a high degree of machine independence, the Meta Assembler from Cosmic "can be used on any host computer with Fortran IV capability and a word size of 32 or more bits," the clearinghouse said.

For any given use of the package, the host configuration is defined at assembly time. The software can produce object modules for any target CPU through parameters also defined by the user at assembly time, Cosmic noted.

Written in Fortran IV and intended for use in batch mode, the package includes "approximately 16,006" source statements. It is cataloged as MFS-23449/CW and is available for $1,590 (documentation costs an additional $21) from Cosmic, 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

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Excessive paging and inefficiencies lead to higher system overhead. That's not what you had in mind when you went to VS.

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APO works on all types of programs: proprietary programs, TP systems, compilers, and anything else that contributes to a paging overhead.

High paging is the flag that tells you where APO can save you money.

There's a lot more we can tell you about APO. You can get it in writing or over the phone. Call or write Boole & Babbage Inc., 850 Stewart Drive, Sunnyvale, CA 94086, (408) 735-9550. Just tell us you believe in automation and low overhead.

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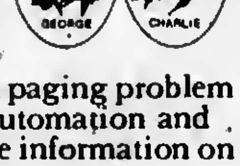

George & Charlie, I've got a paging problem and I'm a true believer in automation and low overhead. Send me more information on APO so we can optimize our VS paging—*automatically!*

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Firm Decides Against CPU Upgrade

Paradyne PIXs Cure Drug Wholesaler's Workload Ills

By John P. Hebert
Of the CW Staff

NEW YORK – An independent pharmaceutical supplier here was forced to make a decision between modifying the communications portion of an order entry system or making a costly upgrade to a larger mainframe when additional processing requirements of a company division pushed it into a full second-shift operation.

Commons Bros., Inc., chose to install one of the first Paradyne Corp. PIX II Parallel Interface Extenders rather than upgrade from its IBM 370/115 Model 1 to a Model 2, according to John Ferrick, DP manager at the wholesale drug firm.

The 370/115 mainframe was Commons' introduction to computerized order entry procedures. It was installed in March of 1975, along with eight IBM 3277 terminals and other peripherals.

The CPU ran under DOS/VS and the Distribution Order Entry System (Does) developed by Lag Drug, Ferrick said. Commons modified the Does package to support its central warehouse in Manhattan, which went on-line in September 1975, and County Drug, a company division in the Bronx.

This completely computerized Commons' hospital contract billing system, he said.

Last February, County Drug became fully supported by this system and orders for druggists' supplies were pooled at the central location.

Workload Degraded CPU

With the additional transactions, paging and core requirements associated with the Bronx division, however, Commons experienced "serious degradation" of the mainframe's ability to handle the workload, Ferrick said.

Power/VS overhead on the system was taking about 40K of the 192K real storage and 172K of the 512K virtual storage in the machine and throughput really went down, he recalled.

Common decided the optimum configuration would have to reduce the system paging rate, increase printer speed and decrease the printer forms changing at the central site during critical billing periods.

"Paradyne was able to solve all the problems," Ferrick said, including allowing the firm to stay with a 2,400 bit/sec half-duplex private line between the Bronx and Manhattan facilities rather than upgrading to a 9,600 bit/sec full-duplex line.

The PIX II units operate under IBM's Synchronous Data Link Control (SDLC) with a "very efficient line utilization. We get about 4,800 bit/sec performance because of the data compression methods utilized by the units," he said.

The IBM Integrated Communications Adapter (ICA) was not able to offer the same kind of data compression, he added.

After installing the local and remote PIX II units, Commons was able to replace 300 line/min IBM 5203 printer and 300 card/min IBM 1442 card reader with Paradyne 300- and 600 line/min printers and a 600 card/min reader at the central location, he said.

At the remote warehouse, an IBM 3774 terminal emulating a 2770 was eliminated. Commons had "horrible problems" with the 3774 before it was removed, Ferrick said.

Relatively slow line printer and card reader peripherals were replaced by faster, 300 line/min Paradyne devices, he added.

Time and Dollar Savings

Connecting one PIX II unit to the multiplexer channel of the CPU and installing the Paradyne peripherals brought both time and dollar savings, Ferrick said.

First, there was no need for IBM's ICA or the remote teleprocessing portion of Power/VS. This represented a savings of 22K real storage and 48K virtual storage, he said.

Secondly, Ferrick continued, Commons was able to keep the 2,400 bit/sec line to support the higher speed peripherals at the central and remote sites.

"We were able to increase our local device speed and almost completely eliminate the need for forms changing since one printer was dedicated during the day to the invoices," he said.

Additional Storage Released

Beyond these benefits, the additional storage released from the Power/VS partition allowed the drug wholesaler to reallocate the real storage to the billing partition, enabling the shop to run most of the batch jobs and billing system in real mode, he said.

"This radically reduced the system's overall paging rate and reduced the elapsed time of the invoicing operation from 20 minutes to six minutes.

"The overall operation time was cut by four hours due to the sum of all these savings, representing a 25% savings in total system throughput," Ferrick said.

PIX II support at Commons has been extended beyond unit record devices, allowing the company to add more IBM 3277 CRT terminals at the Bronx location without modifying the current local order entry system, he said.

The PIX II system was up and running 30 days after it was ordered, he said, adding the addition cost was $2,400/mo – almost the same cost of the peripherals and other devices replaced.

The other alternative didn't pose much competition for the one chosen, Ferrick noted. There was an eight-month wait for an IBM 370/115 Model 2 and it also would have been very expensive, he said.

Bell DP-Oriented Transaction Service Okayed

By Ronald A. Frank
Of the CW Staff

SEATTLE – Pacific Northwest Telephone Co. has gained experimental regulatory approval here for a DP-oriented communications service designed for banking and other functions.

Called Transaction Network Service (TNS), the Bell offering will include a polled version of the AT&T credit authorization terminal to be called the Transaction III Terminal.

The switched service will operate over Bell dial-up lines and will convert asynchronous signals from the terminal into binary synchronous data format for entry in a CPU or terminal to be supplied by the customer.

Under the experimental TNS tariff, noncarrier terminals can be interfaced by the customer. At a recent conference, Bell representatives explained TNS will use Ascii data link protocol based on the Ansi X3.28 standard. Although similar to the standard, the as-yet-unnamed protocol could provide some interfacing difficulties, according to a spokesman for an independent terminal supplier.

The TNS offering allows messages to be transmitted up to 128 characters. The service is controlled by a TNS switch which is a modified version of the Bell ESS 3A. This switch looks at each inquiry initiated at a customer terminal and checks parity, longitudinal redundancy and that the terminal is authorized to access the DP center.

Two types of TNS are available in polled or nonpolled mode. The polled sequence operates at higher speed and includes the Transaction III Terminal which does not have a telephone handset and which accepts only answers which can be displayed on the LED display.

On the low-speed side, a Transaction I or II telephone or Touch-Tone phone can be used with answer-back, tone answer or low-speed data at 150 bit/sec, AT&T said. Both service types can be used with noncarrier terminals.

The access line between the TNS switch and the customer DP center can operate at 2,400-, 4,800- or 9,600 bit/sec. In addition, CPU-to-CPU inquiries can be handled, but messages over the TNS cannot exceed 128 characters in length.

The cost of each message is based on a Transaction Message Unit which is priced at $.001 plus five message units up to 32 characters; six message units from 32 to 64 characters; and seven message units from 64 to 128 characters. The dial-up low-speed capability also includes a holding time charge of $.0012 for voice or tone answer-back and $.0006 for data answers (150 bit/sec).

Messages initiated by the Transaction I, II and III are initiated by plastic magnetic stripe cards that conform to American Banking Association standards, but messages can be initiated manually from Touch-Tone phones or other customer-provided terminals.

The Northwest Bell tariff states that the customer has the responsibility of subscribing to "an adequate number of access lines to handle message volume. Failure to do so will result in inquiries being turned back to the point of origin."

At present the TNS service has been tariffed only by Northwest Bell and is due to expire on June 1, 1977, unless extended. There are no TNS customers yet, but the first in the Seattle area is expected to be in operation by the end of the year, an AT&T spokesman said.

In addition to banking, the TNS offering is designed for reservation systems, quotation services, library retrieval and others, a spokesman said.

Raytheon Has Reader For PTS-100 Badges

NORWOOD, Mass. – A security badge reader for use with Raytheon Co.'s PTS-100 programmable terminal system has been introduced by the company.

The Model 6140 reader was designed for system entry and security applications with Raytheon's IBM 3270 emulation program and is used on a one-to-one basis with each display terminal in a network, the company said.

The device accepts a perforated plastic card which can be precoded with up to 14 digits of numeric information that identifies the operator as well as the level of data for which clearance can be obtained, it said.

The Model 6140 costs $750 or $35/mo including maintenance on a one-year rental. Volume discounts are available on a purchase-only basis, the spokesman said from 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

Let's talk about a brand new Terminal

Here it is! The *new* AJ 832. This new printer terminal combines high speed with versatility, reliability, and operating convenience. There are plenty of features as well, for example:

- A 256-character buffer memory
- ASCII, EBCD, and Correspondence Codes in one
- 30 or 45 cps throughput
- 17 key numeric pad with programmable function keys
- High speed plotting and plotting software, too
- APL keyboard

There are many options available too, such as pin feed platen or forms tractor, side shelves, and fan-fold paper trays.

We have a nationwide sales and service organization to stand behind every new AJ 832, and you have the choice of purchase or lease (month-to-month if you wish).

We'd like to talk about everything this new AJ 832 has to offer. We'll start by sending you our brochure. Just fill in the coupon or give us a call direct.

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Guide Details 130 Teleprinters

PENNSAUKEN, N.J. – Auerbach Publishers, Inc.'s 166-page *Guide to Teleprinters* covers the major features of more than 130 devices to help business communications users evaluate and select printing communications terminals.

The guide offers detailed descriptions of 35 major terminals, including the manufacturer, price, product features, limitations, competitive performance, compatibility and maintenance characteristics, Auerbach said.

In addition, the soft-cover booklet contains a product class report covering the teleprinter marketplace, technological advancements, system design, selection guidelines and future trends.

The guide notes, for example, that an estimated 200,000 teleprinters are in use today and Teletype Corp. products account for about 50% of these, while IBM Corp. has another 26% with its 2740 and 2741 and the recent 3767 series.

For these reasons, according to the guide, Teletype and IBM have forced other manufacturers to make terminals compatible with their offerings and this compatibility "has almost reached the position of being an absolute requirement."

The publication also predicted "the impact of IBM's Synchronous Data Link Control (SDLC) will certainly be felt by all IBM users and, in fact, by the entire data communications industry."

The *Guide to Teleprinters* costs $24.95 from Aucrbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Harris DMA Multiplexer Accepts Eight Lines From RS-232 Units

FORT LAUDERDALE, Fla. – Harris Corp.'s Computer Systems Division has introduced a microprocessor-controlled multiport dedicated communications I/O channel said to be capable of accepting up to eight asynchronous lines from terminals or modems.

The Series 8400 direct memory access (DMA) communications multiplexer operates under the control of an 8-bit microprocessor, Harris said.

It concurrently controls the character-level protocol, error checking and buffer maintenance of each port at aggregate data rates up to 76.8 kbit/sec or each line at transmission speeds of 9,600 bit/sec, Harris indicated.

The asynchronous line interfaces are configured in pairs; each has its own parameter stack, vectored priority interrupt and word assembly/disassembly buffers to operate independently of the other, the company noted.

The DMA multiplexer is installed in an I/O channel slot and interfaces directly to the memory buses in the CPU backplane. It operates on any Harris computer and is supported by both DMS and Vulcan operating systems, the company said.

Four port types are available on the Series 8400 multiplexer: a 20mA port for teletypewriters; an RS-232C port for RS-232 terminals; an RS-232C modem port for Bell-compatible modems; and a differential port for all Harris CRTs and terminals.

The basic multiplexer is standard on all S100 and S200 systems; the price for addition of ports to these multiplexers is $550 for each twin port, Harris said.

A Series 8400 with four asynchronous ports for any of the company's Slash computers is $3,900. Harris can be reached at 1200 Gateway Drive, Fort Lauderdale, Fla. 33309.

Terminal Transactions

Datatrol Device Links Banks With Retailers

HUDSON, Mass. – Datatrol, Inc. has a terminal system designed for use by banks wishing to provide authorization services to its retail merchant customers.

The FT32 reportedly provides a system for on-line check cashing, credit-card authorization and electronic funds transfer transactions. It is available with or without a magnetic stripe card reader and an optional personal identification number (PIN) pad.

The terminal allows customizing of graphics including its 10-digit LED display, its 16-button keyboard (numeric keys plus six functions) and its 12-window message indicator panel. It incorporates an LSI microprocessor, allowing it to operate without a local controller, Datatrol said.

Where direct connection is not required, the unit can be configured into a network including Datatrol concentrators. Within such a network, FT-32 units can be clustered in groupings and be served by the Datatrol concentrator.

A minicomputer which serves as a store-and-forward center polls the network and interfaces directly with the bank's CPU or front end, a spokesman explained.

Supporting firmware is available for the FT-32. Communications control, terminal control and control of such applications as check guarantee and validation processing are provided in a software package.

Conventional communications disciplines are used to minimize the programming requirements of the central computer facility, Datatrol said.

The magnetic stripe card reader has no moving parts and meets the 1972 Track II American Banking Association specifications. It can recover stripe data at speeds from 4- to 35 in./sec and compensates for interbit variations as high as 25%, the firm said.

The optional PIN pad is equipped with 10 numeric entry keys and an "Enter" and "Clear" key.

The basic FT-32 costs $700, the magnetic card reader is $200 and the PIN pad costs $90. First deliveries are scheduled for late 1976 from Datatrol, Kane Industrial Drive, Hudson, Mass. 01749.

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Beehive Super Bee CRT	1,500.00	84.95
Techtran 4100 Datacassette	950.00	54.95

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Insurance Agency Switches to Multiterminal System

PORTSMOUTH, Ohio – A group insurance agency here has replaced its unit record equipment with a multiterminal, shared data entry and concurrent processing system.

In the process, the company has had to convert more than 15 years' accumulation of punched cards and is completely eliminating extensive rows of tub files containing active client index cards.

The punched cards were converted to magnetic tape by a Sycor, Inc. Model 340 terminal with flexible disk option and a 250 card/min card reader. As the cards were run through the reader, they were edited for out-of-range conditions, displayed on the terminal's screen for review, batch balanced and spooled to magnetic tape for processing on an IBM 3.

The process has taken nearly 10 months, according to Charles Herrmann, general manager of Daniels-Head & Associates, Inc. "We can now know exactly what plans and amounts of insurance a client has in force – the premiums, special riders, any claims or applications pending – and we know it immediately," he said.

"That was the weak link in our control," according to Herrmann, whose firm specializes in developing insurance programs for state and national organizations such as the American Optometric Association and the Association of Trial Lawyers of America.

"The problem was that we have so many clients who carry several policies within the various group programs that we had trouble consolidating the file information for their different coverages. In fact, it could take several days to locate information to prepare coverage status reports."

That was compounded by the fact keypunching was a centralized operation with all user departments sending the source documents to it. "Occasionally, if a client wanted to know the status of an application, the source documents would be in transit and we couldn't supply the correct information on the spot," Herrmann said.

When the coverage information was available, a synopsis was stored in an enormous tub file of index cards, but since Daniels-Head clients often carry several policies, it required a clerk looking in all the group policies under which a client could conceivable be insured.

Daniels-Head now uses a 20M-character "electronic tub file" resident on its Sycor 440 clustered terminal processing system to store coded master file information that used to be stored in boxes of punched cards at the company's Portsmouth headquarters.

Individual client names are set up with identification numbers based on their name and birth date. Accessing them is a matter of keying in the correct code number on one of the system's eight video display stations.

The name and all qualifying information flashes on the 576-character display screen (and may subsequently be printed out on the attached 60 char./sec printer) within seconds, compared with the hours or days it took under the manual system.

Rate changes and other across-the-board changes are also done electronically by entering the change for each age-group bracket and having the system adjust the individual records for the entire group.

The problem of knowing the current status of a policyholder is also eliminated by having video display stations in the user areas – accounting, underwriting, incoming applications and claims (instead of a central keypunch section) – all of which can access the common shared disk.

The user groups now enter their own information, instead of sending the source documents to a central keypunch section. "That way we are sure the status report of a client is up to date because there are no documents in transit," Herrmann said.

"And all entered information is checked by the terminals for completed fields and out-of-range conditions," he added.

The Sycor 440 has significantly reduced the company's reliance on its IBM 3, according to Herrmann, and is also being used to edit and accumulate batch totals on general accounting information which is then transmitted to the 3 where the corporate ledgers are maintained.

The Sycor 440 is also being used in the Daniels-Head direct mail operations where names and addresses are maintained on magnetic tape for the groups and associations which vary in size from several thousands to over a quarter of a million members.

Selected names for a mailing campaign are then spooled on the Sycor 440 in a four-up address label format and are then printed off-line using the company's Model 340 terminal with its flexible disk option and a 600 line/min printer.

With the Sycor 440-centered system, Daniels-Head has all the advantages of a large centralized system and then some, according to Herrmann. "Competitively, we have the ability to provide home office functions locally and can now react more quickly to the demands of our clients."

Short-Haul Modem Bows at Bo-Sherrel

NEWARK, Calif. – The M-1 shorthaul modem from Bo-Sherrel Co. is intended for asynchronous transmission with EIA RS-232 and CCITT V-24 interfaces.

Transmission speeds handled by the device in short-haul configurations in maximum distances from two to 10 miles are 600- to 9,600 bit/sec, the company said.

The M-1 modem is priced at $149 with delivery normally in four weeks, Bo-Sherrel said from 36443 Shelley Court, Newark, Calif. 94560.

Monthly Newsletter Bows

RAMSEY, N.J. – A monthly newsletter describing common carrier and regulatory events of interest to telecommunications users has been introduced by the Center for Communications Management.

Called *This Month in Telecommunications*, the publication reportedly will also cover reference and research features. Regulatory issues at the state level and positions on current issues by outside contributors will be included.

The newsletter costs $75/year from the center at 79 North Franklin Tnpk., Ramsey, N.J. 07446.

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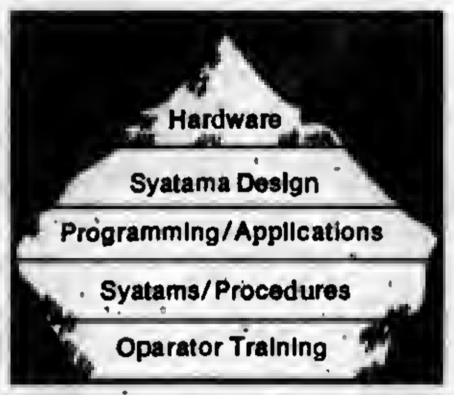

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Bits & Pieces

Technocadimum Selling Time On New York Univac 70/35

NEW YORK – The Rent-a-Computer Service Center run by Technocadimum Data Corp. here in mid-town Manhattan has time available on a Univac 70/35 and is renting it for $10/quarter hour of wall clock time.

The system has a 64K main memory, six tape drives but no disks, a spokesman said. It operates under TOS and is generally available after 3 p.m. and through the second shift, he added.

Recognizing some users need more than 15 minutes of wall clock time to complete their work, Technocadimum President William Hastings said longer rentals "would probably be discounted heavily. I think an hour, for example, might cost only $25 or so."

In addition to providing computer time, the center is planning a number of seminars and short courses in programming and computer science. Each seminar is expected to last one to three evenings and cost less than $20, a spokesman noted.

Technocadimum – and the service center – is at Suite 707, 101 Park Ave., New York, N.Y. 10017.

EPI Has Speed-Tolerant Recorder

ENGLEWOOD, Colo. – Electronic Processors, Inc. (EPI) has announced the availability of an OEM speed-tolerant cassette recorder for use in minicomputer, microcomputer, controller or other systems requiring remote-controlled tape drives.

Performance for the STR-100 was rated by the firm at over 100M bits without an error. The unit accepts asynchronous 8-bit parallel data words, using standard TTL levels with switch-selectable polarity, EPI said.

The data transfer rate is asynchronous up to 125 char./sec, according to EPI.

The STR-100 is priced at $699 in small quantities from the firm at 1265 West Dartmouth Ave., Englewood, Colo. 80110.

Unit Converts Disk to Tape

CHICAGO – The Insta-Disk floppy disk converter from Bank Computer Network Corp. (Bankcom) converts data from disk to tape and vice versa, according to its vendor.

Insta-Disk records data from IBM 9-track magnetic tape onto floppy disks or transcribes the data from up to three floppy disks at a time, sequentially, onto IBM magnetic tape, Bankcom said, adding all data is verified automatically during transcription.

Insta-Disk enables the floppy disk user to communicate directly with the computer via disk-to-tape conversion.

Data from one disk can be transferred to another for file copy use; data from the same disk can also be duplicated on multiple disks, it added.

Data can also be transmitted from one diskette to another, from disk to tape or from tape to disk via phone.

The Insta-Disk permits editing by logical record and field according to user or vendor programs; the unit also permits "surgical formatting" of single sectors to save data on damaged tracks without injury to other sectors on the track, Bankcom said. It is said to be IBM 3740 format-compatible.

Insta-Disk uses a microprocessor and features built-in diagnostics, Bankcom said. It is available for $15,000 or $200/mo from the firm at 333 N. Michigan Ave., Chicago, Ill. 60601.

No Great Program Changes Needed

Upgrade From IBM 3 to 370 Called Easy

By Don Leavitt
Of the CW Staff

MONTREAL – Users can convert from an IBM 3 to a 370 and bring most of their programs along virtually intact without a great deal of effort, according to an IBM systems engineer who has been through the process with a number of clients.

Speaking to a technical session at a recent meeting of Common, a group of small IBM systems users here, however, Richard Zonghetti said there are some language differences and some systems incompatibilities that could make the changeover awkward if they aren't recognized ahead of time.

It is essential to put together a checklist of everything that must be done and all problems that are expected and to have this list before any conversion is started, he said. Later he distributed an example of such a list.

One of the areas in which there are "very dramatic differences" between the 3 and the 370 under DOS/VS is in disk organization, Zonghetti said, noting, for example, that users cannot dynamically allocate file space on a 370, as they may on the 3.

The 370 approach also differs from the 3 in supporting fixed block sizes and the use of expiration dates, instead of a RETAIN option, to protect files from premature destruction, he added.

Among the potential coding problems, Zonghetti cited random retrieval of a sequentially organized file. The System 3 disk RPG-II can manage this through use of a relative record number and the CHAIN operation code, he said.

But DOS RPG-II does not support the use of relative record numbers with sequentially organized files, and a diagnostic will appear if this technique is attempted. To get around this problem, Zonghetti urged users to convert all sequential files which are randomly processed to index sequential format.

The same type of problem arises when adding records to a sequential file. "By some strange little quirk," System 3 RPG-II permits this type of operation; DOS RPG-II does not. Again, the solution normally would be to convert sequential files to index sequential and add records with successively higher keys, Zonghetti said.

An alternative method would be to sort the records to a sequence and then merge them with the sort/merge program, he said.

The set of rules for file names is still another place in which System 3 and DOS RPG-II disagree. They each allow eight character names, but the operating system on the 370 requires names to be unique within the first seven characters. "If you run into this in moving to the 370, change the name: that's all you can do," he said.

In still another instance, System 3 disk RPG-II allows the printer to skip to a line number on the user's form; DOS RPG-II skips to a channel number on a carriage control tape. The procedure to get around this is to convert all skipping entries from line numbers to channel numbers, and be sure to have a carriage tape with corresponding holes, Zonghetti said.

Although "conflicts" exist between the two systems – even though each is labeled RPG-II – there are a number of programs around that may smooth the conversion effort. In particular, IBM has a number of Field Developed Programs (FDP) that can help, he said.

CPU Helping Researchers Study Cancer Incidence in 'Ideal Lab'

HONOLULU – Researchers at the University of Hawaii here are developing computerized population records of the Hawaiian Islands to help identify groups with a high risk of cancer incidence.

They believe this may lead to a reduction in both cancer incidence and mortality through preventive measures. Hawaii provides an "ideal laboratory environment" for the study because the islands contain many different racial groups that are relatively immobile, a spokesman explained.

The researchers use the university's IBM 370/158 to maintain genealogical records of cancer patients and provide a large statistical base for the project. Security codes restrict access to the data to the medical research teams.

"We are comparing various racial groups and sectors of the population and analyzing their demographic characteristics," according to Dr. Lawrence H. Piette, executive director of the Cancer Center of Hawaii. The center, with financial support from the National Cancer Institute, was established at the university to launch research programs into the causes of cancer.

"We entered information on school children into the IBM system by blood grouping and by heights and weights at different ages," Dr. Nabil Rashad added. "This may be useful in determining what effect nutrition has on cancer," the genetics professor and acting head of the Cancer Center's data and computation unit explained.

Tall and heavy women seem to be more susceptible to breast cancer than slighter females, Rashad said. The computer studies may help determine if this is a genetic profile formed early in life; if so, these women will be urged to change their diets and life styles.

The researchers also use the computer to link publicly recorded events involving the same individuals, such as births, marriages and deaths, to form personal histories. They try to construct family trees by relating people through descent and marriage.

"Other factors, such as genetic background, also may play a significant part in the causes of certain types of cancer," Piette said. "We are studying immigrant groups and their descendants in Hawaii and the same ethnic people in their native countries in an attempt to determine differences in cancer incidence and mortality."

ICN Offers Negotiation Seminars

WINTER PARK, Fla. – International Computer Negotiations, Inc. (ICN) is offering to present a seminar on computer negotiations to user groups and other professional organizations.

The firm will tailor the seminars to meet the needs of the requesting organization, according to ICN President Joe Auer.

Topics covered include assembling the negotiating team, determining requirements, equipment and financing alternatives, planning and implementation of negotiations, he said.

As a first step, financial, contractual and contract administration objectives should be established, he said.

ICN reviews how negotiating teams, which can consist of DP, legal, financial and top management personnel, operate.

It also looks at how to determine the user's negotiating requirements, such as survey techniques to collect the data needed.

Priorities should be set on objectives and then parameters on each factor, he said.

In looking at alternatives, ICN reviews advantages and disadvantages of new vs. used gear, multiple vs. single-source vendors and how to analyze rent vs. lease vs. purchase, he said.

Other steps to be considered before the user negotiates are the limits of authority of the negotiating team, the groundrules and rehearsals before meeting the vendor.

Negotiating strategies applicable to hardware, software, maintenance, third-party leases and third-party suppliers are also reviewed, he said.

ICN also discusses how to build an administrable contract and how to administer it, as well as what recourses are available to resolve problems that might arise.

The firm, which provides contract negotiations for DP users, will conduct the seminar for the cost of its expenses. Contact Ken Brindle, vice-president of marketing, at P.O. Box 364, Winter Park, Fla. 32790.

Audio Response System Available

TROY, Mich. – A solid-state multiplexed audio response system has been introduced by Federal Screw Works' Vocal Interface Division.

The Votrax LVM-50 provides multiline audio output and Touch-Tone input handling capabilties for a range of business machines including microcomputers, minicomputers and large mainframes, the firm said.

A 16-line, 32-word system can be purchased for about $1,000/line, which means "a host of Touch-Tone audio response applications are now technically and economically feasible for business minicomputer users as well as others," according to a spokesman.

Features include variable word and message length; custom vocabulary consisting of words, phrases and the voice of the user's choosing; support of a number of audio response data sets including the Vocal Interface Audio Response Modem, Bell 407A, Bell 407B and several commercially available 403-type units; and full-feature support of the Bell Transaction Telephone, Automatic Call Distributor and Call Directors.

The LVM-50 is said to be simple to install and operate. This is made possible by use of microprocessor technology.

Because of this built-in intelligence, the system controller can simulate the operation of an asynchronous terminal (RS-232C) on the host computer's communications port, he said.

The unit is available from Federal Screw's Vocal Interface Division at Suite 102, 500 Stephenson Highway, Troy, Mich. 48084.

Allows More Time for Selling

System Frees Insurance Agents of Accounting Chores

BIRMINGHAM, Ala. – An insurance company here developed a computer-based Field Accounting System (FAS) which frees its agents from accounting chores so they can devote more time to actual selling and the enlargement of account portfolios.

Prior to FAS, Southern Life and Health Insurance Co. agents carried thick collection books with insert pages to record on one side information on the individual or family policies in force and on the reverse side to log in premium payments.

"This system left the agent with a considerable amount of bookkeeping work balancing accounts and preparing information on policy changes for the home office," the company said.

"In formulating FAS, we wanted to design a system based on our size, geographic location and the financial position of the company. We were also seeking methods of reducing the relatively high turnover rate for agents by making their job easier," Jimmy E. Phillips, actuary for Southern Life, said.

FAS was designed in-house on a Univac 90/30 computer, which the company recently installed to replace an IBM 360/20.

The card-oriented IBM 360/20 had limited capabilities and would have been unsuitable for implementing the applications needed for FAS, Phillips said.

FAS, which is written in Cobol, has been running in two of Southern Life's 45 district offices for the last 10 weeks, and all district offices should be included in the system by mid-1977, Phillips said. The result will be centralized control of operations in the home office.

Ruled Out Terminals

Initially, the company is using a courier service to pick up material from the district offices on Friday and return the processed data Monday morning.

"For the time being, we have ruled out terminals because of the high costs involved, but at some future time, with data line costs going down, it may be more convenient for us to shift to a terminal operation," Phillips said.

The computer is used to prepare two copies of route lists weekly for each agent, listing all persons on the agent's route with their address, family group numbers, premiums to be collected and any special comments about the account such as the best time to collect. In the last column of the list, the agent records the premiums he received during the week.

There is also a Family Group record which gives detailed information on the policies held by each account on the agent's route. On the reverse side of this document, the agent records payments and the dates received and gives one copy to the customer as a receipt.

Another document generated by the system is a premium collection form that identifies customers by number, name, the amount of premium and the mode of payment. The agent marks this document to record payments received, and an optical reader scans this information and updates the account records stored in the data base.

Under FAS, the computer constantly monitors due dates for payments and automatically lapses family groups for nonpayment of premiums. It also balances premium collections reported by the agent with the cashier's report.

Individual three-section weekly activity reports for each agent are produced showing a reconciliation of collection activity.

One section of the report shows any discrepancies produced from checking the agent's reports with those from the cashier. The second section summarizes activities for the week and shows any arrears, and the third section reports the caliber of policies written by the agent, analyzing business over various time frames.

The district manager receives a summary of the report covering those agents reporting to him and regional vice-presidents receive a summary for all district offices under their control.

Benefits to Outweigh Costs

Although implementation of FAS has been an expensive undertaking, "it's a must and we are going to put in a first-rate system which we have developed on our own," William R. Lathrop Jr., president of Southern Life, said.

The benefits will eventually outweigh the costs, he added. "We'll have the exact status of every account at our fingertips, and our management people will have a better, more precise picture on which to base their decisions," he said.

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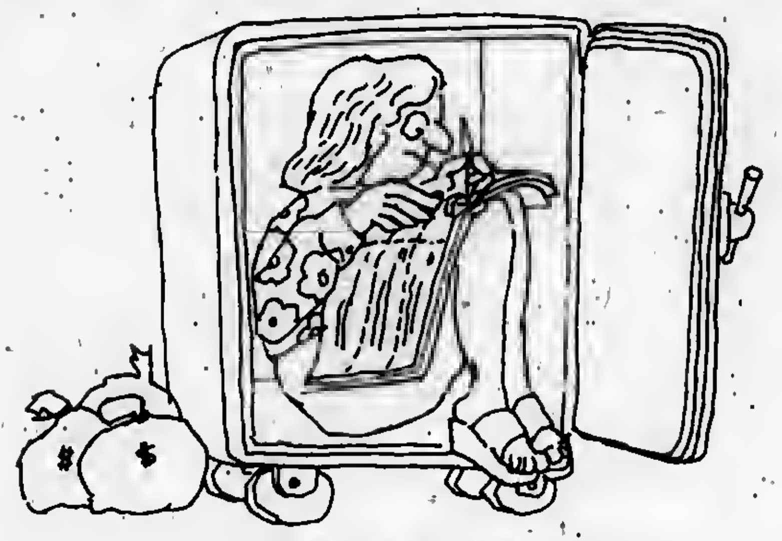

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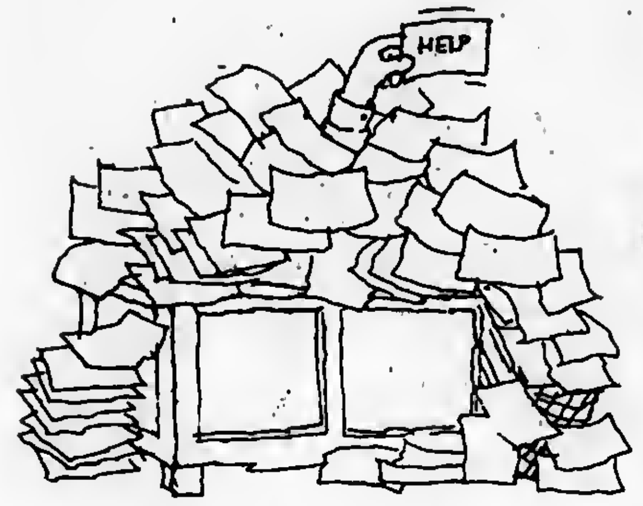
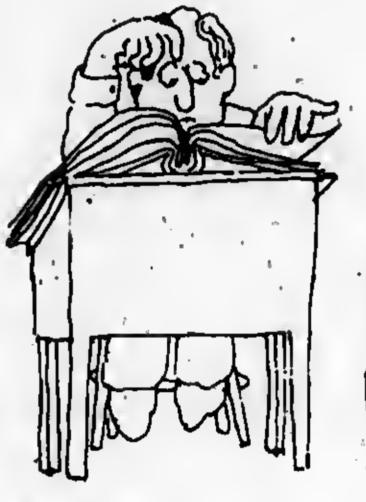


The general accounting system.



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Planning, People, Practice Seen Key to Smooth Switch

By Don Leavitt
Of the CW Staff

MONTREAL – Three key elements of any successful conversion are planning, people and practice, according to William F. Kluckas, worldwide systems and procedures manager for E.R. Squibb & Sons, Inc.

One of his units shifted from a card-oriented IBM 3/6 to a cardless 3/8 earlier this year, he told a recent meeting here of Common, a group for small IBM systems users.

Planning must be "thorough, anticipative and documented," he said, while people must be trained and supported. "And they must be given sufficient time to practice their newly acquired skills before entering the production environment," he added.

The changeover Kluckas described involved Squibb Puerto Rico which sells and distributes finished goods imported from Squibb plants in the U.S. mainland, the UK and Canada. Two warehouses – one in San Juan, the other in Barbados – serve 1,200 customers and process 950 order/mo.

There are 45 employees, three of whom are in the systems and DP department in San Juan. The 3/6, installed since June 1973, was replaced by a 3/8 this February, giving the site a "slightly bigger, much faster system at more or less the same net cost."

The "real plus," however, came from the move to a cardless environment, Kluckas said. An on-line key data entry station and an IBM 5496 Data Recorder card reader "with a speed of perhaps 22 card/min" are "no match for 3741 read speeds of 1,500 record/min," he noted.

Plan of Action

The plan of action had eight steps, the manager said. These included a moratorium on program maintenance, scheduling hardware installation, technical education and benchmarking to determine the scope of work involved and to quantify Model 8 timing improvements.

Recompiling the existing RPG-II programs and then paralleling the Model 6 and Model 8 runs was to be followed by the actual cutover. The level of support expected from both IBM and Squibb home office was also defined, Kluckas said.

The moratorium went into effect Feb. 1, with the understanding that the financial manager – the person to whom the DP function reports – could authorize critical modifications. The freeze was lifted March 1 at the completion of the changeover.

Squibb took early delivery of its first 3741 to familiarize operators with its use. In preparation for the parallel operations, an additional electrical line was activated and the Model 6 was moved to a temporary location in the computer room to make room for the 3/8.

Operator Training

Training for the 3741 operators was done through a self-study course and several half-day practice sessions. The objective was to have the DP staff completely at ease with the 3741 before it became a production machine, the manager said.

"Receiving this training unit 1-1/2 months before cutover proved to be ideal timing," he commented. "Any later would not have allowed enough learning time; any earlier would have given too much."

Meanwhile the DP supervisor took a two-day course on the programming and internal aspects of the 3741 and received hands-on 3/8 training during Squibb's benchmark effort. This was supplemented by in-house training for all three DP staffers after the computer was installed.

Three RPG-II programs and one sort from the invoicing system were selected as a representative sample for the benchmark. The Model 8 reduced compile time from 47 minutes to 21; execution time from 83 to 19. Even though the test machine had a 300 line/min printer vs. the 200 line/min machine Squibb would have, "these improvements were dramatic," Kluckas said.

Program Changes

Coding modification time for the test amounted to 15 minutes a program, but that dropped to about 10 min/program later. Squibb Puerto Rico had a library of 172 RPG-II programs. Of these, 68 required "minor header, printer and input/output control card modifications," according to Kluckas.

Another 35 programs requiring minor modifications were not needed for the cutover, so work on them was deferred. Only two programs had to be entirely rewritten, he said, noting they were file maintenance runs which could receive input only from the Model 6's data entry system.

Sixty-seven programs were deleted, Kluckas recounted. They were of the one-time special request "quick and dirty" nature and no longer required, he explained. Overall, Kluckas said he was surprised and pleased at how little change was needed to convert the useful parts of the existing library.

The question of parallel processing is "always a difficult one," the speaker said, but since in this case no applications redesign was involved, "we decided to parallel, 100%, the operations for the last day of the month and the month-end processing for February." The next to the last business day was processed through the Model 6 as usual. Then all master and balance forward files were copied, creating a set of disks for the Model 8.

Transactions for the last day were keypunched, processed through the Model 6, copied to diskette and processed through the 3/8.

A comparative check of the daily results revealed "100% accuracy," Kluckas said, adding "month-end reports were also run in full parallel and again were 100% in phase, old vs. new."

IBM's 40-hour, preinstallation test allowance was "virtually unused," he said, since the vendor had only a 3/15 at its data center.

The benchmark had to be run at a customer site, and Kluckas warned his listeners to "be aware of any similar support difficulties in your area and prepare to use them as leverage in negotiating sessions."

IBM support otherwise was excellent, however, he said. So was backing from Squibb home offices. And since everyone knew what was expected of them and produced, the conversion went very well, Kluckas concluded.

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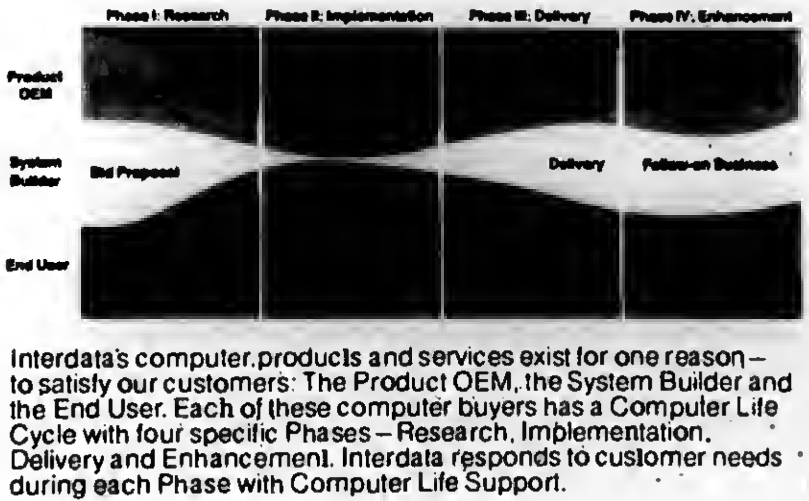

Interdata's computer products and services exist for one reason – to satisfy our customers: The Product OEM, the System Builder and the End User. Each of these computer buyers has a Computer Life Cycle with four specific Phases – Research, Implementation, Delivery and Enhancement. Interdata responds to customer needs during each Phase with Computer Life Support.

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MINIWORLD

Mini Bits

IBM Puts 3/6, 3/10 on TAP

ATLANTA – IBM announced an extension of its Term Availability Plan (TAP) to 3/6 and 3/10 CPUs and related features.

Standard rental prices will be 5% higher than those under the three-year TAP, the firm noted.

Extension of the TAP to models 6 and 10 is in line with terms for other central processors of the 3 line, IBM said.

In addition to the price differential, the TAP provides lease and purchase price protection through the first year of the term and purchase accruals for 36 months up to 50% of the purchase price, it added.

DPMA Chapter Sponsoring Show

EL PASO, Texas – The El Paso Chapter of the Data Processing Management Association (DPMA) is sponsoring the first multivendor computer show held here, it said.

The event is scheduled to coincide with the DPMA Region III International Directors meeting to be held Sept. 23 and 24, it noted.

The show is limited to minicomputer and supporting equipment vendors.

No admission will be charged, it said from P.O. Box 1894, El Paso, Texas 79950.

Mesa Two Gets Peripherals

SAN DIEGO – Two additional peripheral devices for the Mesa Two models 7000 and 9000 have been introduced by Martin, Wolfe, Inc.

The Model 0911 magnetic tape drive is an Ansi-compatible unit which accepts 10-1/2-in. reels and records data in a 9-track, 800 bit/in. mode and operates at 45 in./sec.

The tape system includes transport, read/write head, read/write electronics, control electronics and power supply.

The 0922 card reader is a heavy-duty unit designed to operate in remote terminal applications requiring fast and simple loading and unloading, the firm said.

A slant-top feature of the card reader uses the principal of gravity to allow smooth card flow for easier unloading and loading of cards while the reader is in operation, it noted.

The card reader includes control and timing electronics, Martin, Wolfe said.

The magnetic tape unit costs $18,200 and the card reader is $8,200 from Martin, Wolfe, Inc. at 9830 Willow Creek Road, San Diego, Calif. 92131.

Unit Loads PDP-11 Programs

ANAHEIM, Calif. – An interface configuration for the Datum, Inc. Model 400 universal recorder provides program loading for Digital Equipment Corp. PDP-11s, the firm said.

The paper tape reader/punch emulator consists of a standard Model 4000 and an interface controller board embedded in the PDP-11. The controller emulates the paper-tape reader, giving 1,000 char./sec read/write capability.

In operation, users may either transfer system and application programs from paper to cassette or record new programs on tape, the firm said.

The recorders are available as single-transport desktop units or as dual-transport rack-mounted units. The transports read/write at 30 in./sec, rewind at 120 in./sec, the firm said.

The single-transport system costs $3,150; the dual transport is $4,145.

Datum, Inc. Timing Division is located at 1363 S. State College Blvd., Anaheim, Calif. 92806.

Distributor to Save $125,000/Year

Four Turnkey Minis Replace IBM 370

By Esther Surden
Of the CW Staff

COLUMBIA, Md. – Mid-Atlantic Toyota Distributors, Inc. here is in the process of replacing its IBM 370/125 with four dedicated minicomputers to realize an estimated $125,000/year savings, according to the user.

The firm, which is presently running in parallel on the 370, has three of the four minicomputers and their respective dedicated applications on-line. The fourth is expected to be up the end of August, according to R.W. Townsend, computer service and systems manager.

Originally the company investigated the costs involved in going on-line with IBM, Townsend said. The results of that study indicated that to add the capabilities to the IBM system would cost "65% more than we were currently experiencing" and take 2-1/2 years to implement, he said. The firm then turned to minicomputers as a possible alternative.

The minicomputer area was packed with likely systems, Townsend said, but the decision was narrowed to three companies he felt could supply the firm's special needs. These were Digital Equipment Corp., Microdata Corp. and Display Data Corp., a Maryland turnkey systems vendor.

Display Data had been in the automotive software business previously and several Toyota dealerships had used its software systems with success, so the firm decided to take a chance on the three-year-old company, Townsend said.

The four minicomputers installed at Mid-Atlantic are each dedicated to a special application. The systems can exchange data, but they do not share disk files, according to Townsend. The CPUs are also located in the same room, he noted.

The firm contracted for the minis in February and by July three out of four applications were up and running, he added.

The four systems are a financial analysis and accounting system, a parts analysis system, a recordkeeping system and a vehicle analysis system.

The financial analysis and accounting system is configured around a Microdata 1600 Model 30 CPU with 40K of memory, a disk and controller with 20M bytes of storage, three CRTs, two printers, 165 char./sec printer and a 300 line/min printer.

Applications on this system include general ledger, accounts receivable and payroll. The payroll system, although written, is still being done at a local bank, Townsend noted.

Data entry is done through two CRTs in the accounting department; that department also uses the slow-speed printer for this application, he noted.

Parts Analysis

The parts analysis system gives a total distributor parts inventory, has order entry capabilities and performs accounts receivables. Clerks enter orders and manufacturers' changes through three CRTs in the parts department. One CRT in the warehouse along with another slow-speed printer are used for entering or receiving data at the location.

This system's configuration includes the Microdata CPU with 40K of memory, 80M bytes of disk, five CRTs, a 300 line/min printer, the 75 line/min printer and one tape drive. The tape is used for file backup.

Communications between Toyota headquarters and Mid-Atlantic will be eventually implemented, but presently tape is transported between California and the distributor via the mails, Townsend noted.

The minicomputer dedicated to recordkeeping for the individual dealerships in the Mid-Atlantic area presently performs inventory control applications for dealers who choose to use the mini as a service bureau, he said.

At present, 30 of the 70 some dealers in the Mid-Atlantic states take advantage of the service. Information for this comes in through the mails and is entered in the systems department, Townsend said.

This system is expected to be expanded to include more applications and additional dealerships with CRTs being placed in every dealership that subscribes, he noted.

The present configuration for this system includes the CPU with 48K of memory to accommodate the additional files needed for 30 different dealers, 80M bytes of disk, a CRT and a 300 line/min printer.

Vehicle Analysis System

The vehicle analysis system, which will be up in August, will keep track of automobiles received at the Port of Baltimore. This system, a software package Display Data did not have immediately available for the automotive industry, is being completely rewritten from the IBM programs, Townsend said.

The equipment for the vehicle analysis system includes a 40K CPU with CRTs, a 300 line/min printer, a 75 line/min printer and 40M bytes of disk. The slow-speed printer and a CRT are located at the port and communicate with the system over 1,200 bit/sec lines, he said.

The total four-system cost was $400,000 including all hardware and software. Display Data is performing a maintenance function; each of the CPUs is connected to a CRT in the Display Data office.

Although recognizing this presents a security problem, Mid-Atlantic is trusting the vendor for the moment. A plan to have a switch so the firm will have to allow entry into the system by the vendor is being investigated, he said.

The instability of turnkey vendors is another problem Townsend recognized. He has had two programmers from his office trained by Display Data in the applications, and Display Data "has turned its total operating system over to me," he said, so that, should it go out of business, he is protected. The hardware is configured with major manufacturers' products, he noted, so service is likely to be available for them.

Added Communications Featured In ICL Top-of-the-Line System

NEW YORK – A large-scale minicomputer designed as an upgrade for users with small business systems who need increased communications capabilities has been introduced by International Computers Ltd. (ICL).

The ICL 2904 is the top-of-the-line model of several compatible processors in the ICL 2903 range, the company said, and features a 50% increase in the speed of instruction execution over the 2903.

The CPU can accommodate from 128K to 384K bytes of main storage and up to 510M bytes can be stored on disk at any one time, it noted.

Three types of disks are available for the system. These include a fixed and removable disk with 5M or 10M bytes, a 30M- or 60M byte exchangeable disk and floppy disk with 500K bytes of storage capacity, ICL said.

A magnetic tape system offered with switchable 800 bit/in. NRZI or 1,600 bit/in. phase-encoded recording has transfer rates from 40K byte/sec to 80K byte/sec.

The ICL 2904 has six communications channels; ICL 2903 systems can act as satellites to a 2904 system. In addition, the 2904 can be remotely linked to a large mainframe, ICL said.

Line printers from 300 line/min to 1,500 line/min, card readers, paper tape readers and punches, graph plotters and other peripherals are available for the system, the company said.

ICL 2904

Software includes a multiple transaction system capable of handling up to 40 separate inquiry programs at once and an on-line manufacturing system. The 2904 also features an integrated data base management system, according to the firm.

A typical 2904 with 32K of memory, 180M characters of on-line storage, four CRTs, a 600 line/min printer and a 300 card/min reader costs $300,000 or $6,000/mo to rent, the firm said from 555 Madison Ave., New York, N.Y. 10022.

Interdata Adds Disks

OCEANPORT, N.J. – Interdata, Inc. has announced two large-capacity disk storage units for both its 16-bit and 32-bit computer line.

Both the MSM80, an 80M-byte mass storage subsystem and the MSM300, a 300M-byte subsystem, feature 1.2M byte/sec data transfer rate and IBM 3330-type technology, Interdata said.

The MSM80 stores 67.2M-bytes of data on five platters; the MSM300 stores 256M bytes on 19 platters when formatted for use with standard Interdata operating systems, the firm said.

Both drives have a cylinder-to-cylinder seek time of 6 msec and a 30-msec average access time, the firm said. Extra subsystems can be expanded to include up to four drives, it said.

The basic MSM80 costs $25,000 for interface, disk controller, single disk drive and pack. The MSM300 costs $52,000 in single-unit quantities.

After Trying Manual System, Bureau

Mini Proves Half the Solution for Growing Township

By William Saunders
Special to Computerworld

WEST DEPTFORD, N.J. – When both its population and need for services exploded, this small town turned to a full-time administrator and to DP for a solution.

Careful analysis of paperwork problems and systems needs helped West Deptford develop sound accounting procedures.

The story began in April 1974, when a full-time administrator was hired to systematize purchasing, budget planning and tax collection.

At that time, a review of the township's procedures showed the need for centralized purchasing tied directly to a budget encumbrance system.

It took six months for the township to develop a budget account-coding system for uniform municipal budget preparation as well as a budget manual and the encumbrance system. In January 1975, the municipal budget was prepared for the first time under the structured – but manual – system.

The manual system enabled officials to process bills on a bill list basis and pay vendors bimonthly rather than once a month, as was done previously.

Bureau Gets Payroll

Because it took the town's budget clerk four days a week to do the payroll and because of equipment problems, West Deptford's payroll function was farmed out to a service bureau. The bureau already handled the tax and utility billing/accounting, real property tax records and police reporting on a batch basis.

But using the service bureau presented some problems. Information and reports were not available in time to respond to questions from the government and taxpayers.

A feasibility study showed the money appropriated annually to the bureau could finance an in-house mini and, in addition, give the town the flexibility to add more software as the township's needs increased.

After four months of visits to DP installations and sales representatives, the following selection criteria for the mini were set:

- It had to be an interactive on-line, real-time system with multitasking capabilities and no special preinstallation requirements.
- The system had to use a programming language simple enough to allow existing personnel to do basic programming with a minimum of training.
- The vendor had to supply both hardware and software support, be familiar with municipal government and be capable of designing application programs to meet local and state requirements.

With help from the New Jersey Department of Community Affairs' Administrative Assistance Unit, specifications were developed and approved by the state to allow the town to seek bids on the system.

The selected proposal was offered by Infocomp Corp. for a turnkey system based on a Data General Corp. Nova 2/10 with 64K of memory, 10M bytes of disk, a Centronics Data Computer Corp. 101A printer and two Hazeltine Corp. CRTs.

The Micos operating system gave the town the multiprogramming capabilities it required. Based on a three year lease/purchase plan, the system cost $1,685/mo, with 48% of the rental applied to the $60,000 purchase price.

Hardware was delivered last November and the first application was operational in January.

Versatile Budget System

The budget accounting system is versatile and highly efficient; all purchase commitments can be monitored each day.

With access to the computer via a CRT, the purchasing agent can access each budget line item at his convenience. Further, as soon as funds are appropriated for any given purchase, the budget line item is encumbered.

Department heads are now forced to buy through a purchasing department and comply with the state bidding laws. The future status of any item can be forecast based on the file data.

The system has saved the town considerable auditors' fees since hard-copy audit trails can be printed and reports of transactions can be produced.

The payroll system takes care of a myriad of deductions with only the hours worked entered.

Overtime is automatically computed. Upon completion of the payroll, the wages are distributed and applied automatically to the relevant budget line item.

Saunders is administrator of West Deptford Township.

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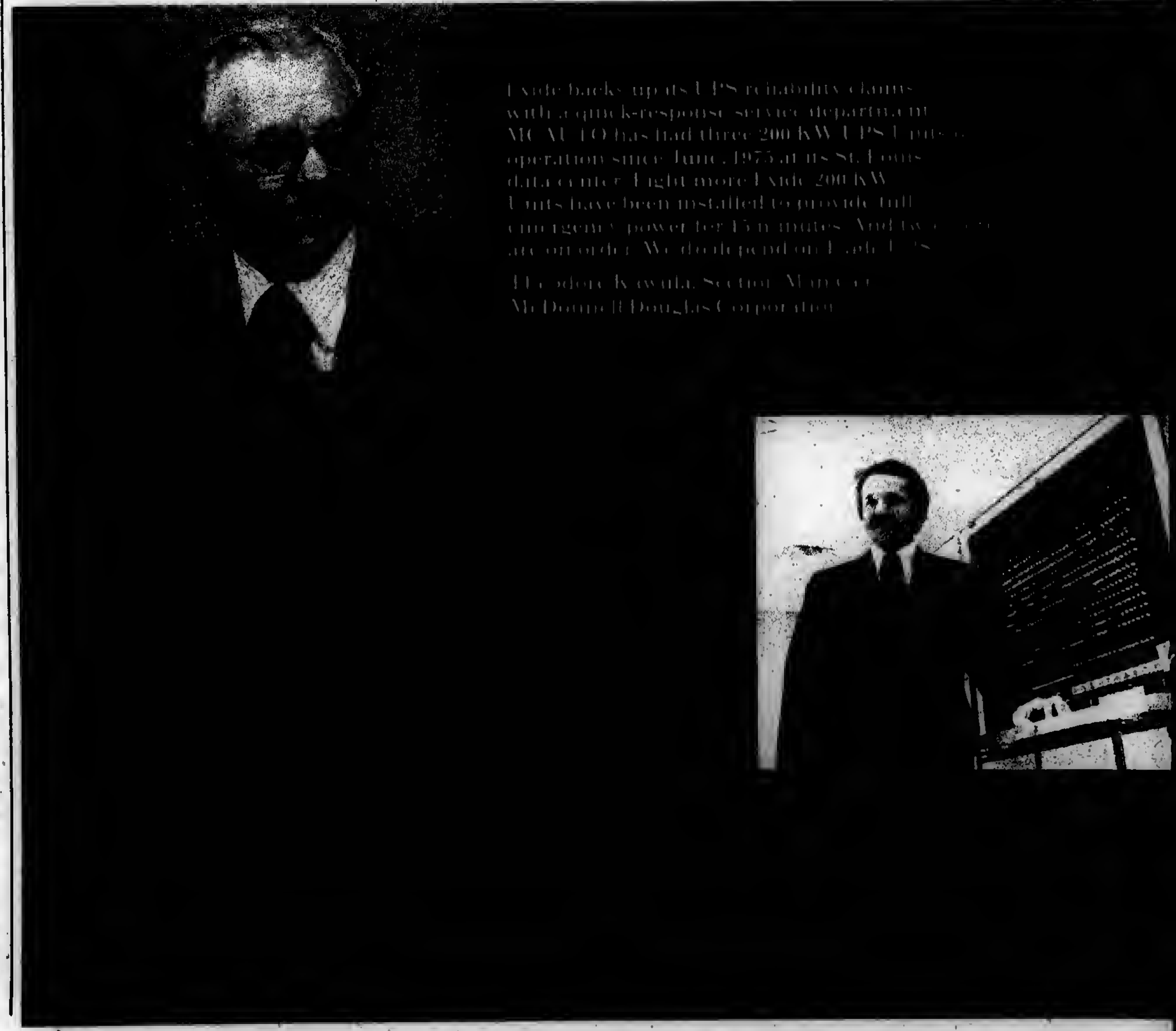

Exide backs up its UPS reliability claims with a quick-response service department. MCAUTO has had three 200 KW UPS Units in operation since June, 1975 at its St. Louis data center. Eight more Exide 200 KW Units have been installed to provide full emergency power for 15 minutes. And two more are on order. We do depend on Exide UPS.

Theodore Kowala, Section Manager
McDonnell Douglas Corporation

Mini Used for Inventory Control Works in Three Areas

MODESTO, Calif. – A minicomputer used for inventory control is helping the Modesto Irrigation District here generate reports for accounting, purchasing and warehouse use, according to David B. Glaeser, manager of the DP department.

Although called an irrigation district, the utility has been selling electricity directly to customers within its geographic area since 1923; selling electricity has become its primary business, Glaeser noted.

Modesto has one warehouse where materials are received and issued to work crews and engineering departments. These materials range from wire and bolts to gasoline and herbicides.

The utility has a 32K NCR Century 50 with 18M bytes of disk, a 450 line/min printer, card reader, I/O writer, a key-to-tape system and controller. The system leases for $3,300/mo.

Tight Deadline

In the fall of 1974, Glaeser was given four months to develop a computerized perpetual inventory control system for all items over which the warehouse and purchasing departments had control, he said.

To meet the tight deadline, he decided to modify the transaction-oriented program for utility billing then being used by Modesto.

The present system was designed to provide both daily and monthly reports. The transaction-oriented system uses such items as batched purchase orders, receivers, stock issues, returns to stock and financial adjustments for delivery charges as input.

On a daily basis, the system produces input batch listings, a transaction journal and a cumulative daily transaction report which covers all transactions to date for the month. Weekly reports include follow-up reports for purchase orders and reorder reports.

Each month, reports which reflect both the financial and stock activity for the entire inventory are produced for the accounting department and other system users.

Modesto uses the averaging method of inventory valuation. When the system was begun, the existing inventory was assigned unit prices by dividing book value by the item quantities.

Since the system went into operation, the unit price of an item has been recalculated after every transaction. An input and error listing for financial adjustments enables Modesto to correct the book value of an item for freight and tax charges.

As a further aid to the accounting department, the value of each transaction as well as the numbers of items involved is shown in the transaction journal and report.

The system also generates a listing which features complete item identification which the warehouse uses in taking inventory. Except for a few high-priced items such as wire, Modesto's warehouse stock is inventoried on a cyclical basis with one-twelfth of the entire stock inventoried each month.

The listing generated for this purpose by the system can include any section of the inventory base and is current to the previous day's transactions, Glaeser said.

Among the reports of particular value to the purchasing department are reorder reports for items which are automatically reordered when certain criteria are met and reports for other reorder items which have shown activity during the month.

The minicomputer runs about 16 hour/day with a staff of two operators, three keypunchers, an operations supervisor and the DP manager.

Ball Has Floppy For Micronovas

SUNNYVALE, Calif. – Ball Computer Products, Inc. has a floppy disk subsystem designed to interface with Monolithic Memory, Inc.'s Micronova processor and Data General Corp.'s (DG) Micronova.

Consisting of two floppy disk drives and a single board controller, the stand-alone Model 3190G subsystem connects to the I/O bus and does not have to reside within the computer, Ball said.

In addition, the unit's chassis will pass the I/O bus to other peripherals if desired. The unit occupies 7 inches vertically in a standard 19-in. rack, Ball noted.

The floppy disk drives feature a storage capacity of 3.2M bits (IBM-compatible), ferrite read/write heads and a positioner that uses three-step movement track-to-track.

The transfer rate is 250 kbit/sec, the firm said.

The controller also features read-before-write address verification, diagnostic mode and individual write protect.

The controller board will interface up to eight disk drives and can also accommodate a real-time clock and teletypewriter interface, it added.

The Model 3190G, including two floppy disk drives and controller, is priced at $4,700. Ball is at 860 E. Arques Ave., Sunnyvale, Calif. 94086.

Exide UPS systems are protecting some of the largest computer centers in the country. An Exide Uninterruptible Power Supply system filters out the spikes and transients commonly found in raw utility power. And, depending on your time requirements, an Exide UPS system will continue to feed smooth, constant power during utility blackouts and brownouts.

Major computer users who rely on Exide UPS systems are enthusiastic about their selection of this equipment. Quoted below are Exide customers whose comments are based on experience. There are many more, since Exide has been an UPS system supplier for more than a decade.

Exide is the only UPS manufacturer that makes all the major components: Rectifier/charger, stationary battery, static inverter and static switch. This means that your UPS will be carefully designed as a complete system. All the components, from the utility power takeoff to the computer interface, have a single source of responsibility—Exide. You can depend on Exide UPS.

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Micro Products

AMI Has Developer, Evaluator

SANTA CLARA, Calif. – American Microsystems, Inc. (AMI) has a Microcomputer Development Center (MDC) and a microprocessor prototyping board for use with Motorola 6800-type microcomputer systems, the firm said.

The AMI 6800 MDS can be used for software development, as a general-purpose data processing system or as an intelligent communications terminal.

The system includes a special-purpose CRT that incorporates AMI 6800 microcircuitry and a dual-drive floppy disk subsystem with more than 500K bytes of on-line storage, AMI said.

For hardware development the system offers remote front panel and read-only memory (ROM) simulator functions and a modular bus-oriented printed circuit card cage supported by general-purpose cards.

Software development programs include the FDOS-II disk operating and file management system and text editor.

AMI 6800 Microcomputer Development Center

The MDC with 16K bytes of memory costs $10,500, the firm noted.

The AMI 6800 Microprocessor Evaluation Board features a built-in programmer for the Eprom microcircuitry. The board can also serve as a general-purpose microcomputer for low-volume systems by the utilization of up to 58 I/O lines and expansion up to 56K bytes of user-available memory, it noted.

AMI 6800 Tiny Basic is included with the system, and a prototyping operating system program resides in the ROM, the firm said.

The board is available in three package options: kit form with the printed circuit board for $295; an expanded kit with 512 bytes of Eprom for $595; and the fully assembled kit with 2K bytes of Eprom and Tiny Basic for $950.

AMI is at 3800 Homestead Road, Santa Clara, Calif. 95051.

Mini Develops System

AMES, Iowa – Computer Applications Corp.'s Minmic 1165, a hardware/software system, allows "the microprocessor user to develop his system on a minicomputer" by using the mini's memory and peripherals, the firm said.

The Minmic 1165 consists of a board that mounts an MOS/Technology, Inc. 6502 microprocessor on the Digital Equipment Corp. PDP-11 bus. Software for the PDP-11 to support the 1165 is also included.

The Minmic 1165 costs $495 and includes the assembled board with the 6502 processor, 1165 software and a manual with full schematics. The firm is at 413 Kellogg, Ames, Iowa 50010.

Software, Speed Pleases Most Users

WALTHAM, Mass. – Eighty-four percent of surveyed microprocessor buyers are satisfied with the speed and software of current products, according to the results of a joint study by International Data Corp. (IDC) and *Computer Design* magazine.

The study, entitled *Survey of Microprocessor Buyers*, indicated three out of every five buyers were incorporating microprocessors/microcomputers into completely new products rather than into improved versions of existing ones.

Process control was the major function being performed by microprocessors/microcomputers, according to the study, and users said increased versatility with cost reduction were the major benefits.

Eighty percent of the study's respondents said microprocessors represented 25% or less of their total equipment cost.

The most important technical criteria for selecting a microprocessor were its instruction set, interface compatibility and speed, the study indicated.

Software development costs represented an average of 42% of total equipment development costs, the study showed. More than 80% of current programming and software was being performed in-house by both programmers and logic designers.

Lower cost and interface standardization were the improvements to microcomputer peripherals mentioned by 40% of the respondents.

Increased reliability and decreased complexity of the peripherals were also desired improvements, IDC said.

The Survey of Microprocessor Buyers costs $395. IDC is at 214 Third Ave., Waltham, Mass. 02154.

Monolithic Adds LSI-11 Memory

ENGLEWOOD, Colo. – Add-in expansion for Digital Equipment Corp.'s LSI-11 16-bit microcomputer is now available from Monolithic Systems Corp. (MSC).

The Monostore XI/Planar semiconductor memory is designed around 4K NMOS dynamic random-access memory (RAM) technology.

The 16K by 16 bit board allows the LSI-11 memory to be expanded within the present chassis, eliminating the need for add-on hardware for memory or peripheral interfacing, the firm said. It also carries "on-board refresh" to eliminate direct memory access problems, it noted.

The DEC LSI-11 is supplied with 4K by 16 bit MOS memory and, in order to fulfill its 28K memory capacity with DEC boards, requires the utilization of all six bus loads the computer can drive, MSC explained.

By employing a Monostore half board (8K) and full board (16K), only two bus loads are used in bringing the LSI-11 to full capacity, freeing other bus loads for interfacing peripherals, the firm said.

The Monostore is software- and hardware-compatible with the LSI-11, the firm said. Because of faster access time and faster cycle time, the Monostore permits existing programs to be used with no modifications.

The price of a 16K by 16 bit Monostore XI/Planar board in quantities of one is $1,195 from Monolithic at 14 Inverness Drive East, Englewood, Colo. 80110.

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.
Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

1. **Data Communications Course #1010 — Practical Data Communications Systems and Concepts.** Led by Dr. Dixon Doll, this two-day seminar is designed for people who are relatively new to data communications. It presents you with a comprehensive exposure to the important terminology, economic aspects, and functional characteristics of contemporary data communications devices, techniques and systems. Money-saving ideas are an important part of this seminar, and you will see how to implement them using innovative techniques like split-stream modems, diagnostics for fault isolation, modem-sharing devices and digital bridges, remote multiplexers/concentrators, and front-end preprocessors. The seminar will focus on the latest developments in data communications, such as SDLC, IBM's new Synchronous Data Link Control, DDS, Bell's new digital data network, and HID-LoD, Bell's newly effective tariff for voice lines. And we'll look at the impact of satellite carriers and specialized carriers as well. This seminar will give you the ability to recognize and solve specific problems in data communications so that you can effect cost savings and performance improvements at your installation.

2. **Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design.** Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Class study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own:
Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithims for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

To enroll, look over the schedules below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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Vice President, Editorial Services
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CI Notes

Honeywell Bull and CII Complete Planned Merger

MINNEAPOLIS – The merger of Compagnie Honeywell Bull with the general-purpose computer business of Compagnie Internationale pour l'Informatique (CII) has been completed, Honeywell said.

The basic terms of the agreement signed in December 1975 with CII and the French government were maintained, according to Honeywell President Edson W. Spencer. The new firm is called Compagnie Internationale pour l'Informatique Honeywell Bull.

The French government will provide subsidies of about $250 million from 1976 through 1980 to offsct transition costs.

Honeywell Information Systems will be paid about $58 million for reducing its equity in Honeywell Bull from 66% to 47%. Payment will be reported in Honeywell's third-quarter statements using the equity method of accounting.

Compagnie Machines Bull (CMB), which owned 34% of Honeywell Bull, will hold 53% of the new company. The public shareholders of CMB will own about 65% of the French holdings, with Compagnie Generale d'Electricite and an agency of the French government splitting the remainder.

HP Forms Customer Service Division

CUPERTINO, Calif. – Hewlett-Packard Co.'s (HP) Computer Systems Group has consolidated its customer service activity into a single new division.

The Customer Service Division will be responsible for customer field engineering, repairing and distributing exchange boards and marketing computer supplies for all of the group's six manufacturing divisions.

Supershorts

Hewlett-Packard Co.'s General Systems Division shipped 20 of its 3000-II systems in June.

– – –

Harris Corp. has created Harris Satellite Communications to serve the commercial market for satellite communications equipment.

– – –

Comten, Inc. has restructured its organization with the creation of the Software Products Division in addition to its Communications Systems Division.

$7.5 Billion in 1980: IDC

Small Business Base to Grow 20%/Year

By Toni Wiseman
Of the CW Staff

WALTHAM, Mass. – The installed base of small business systems in the U.S. is expected to grow at an average annual rate of 20% from just over $3 billion in 1975 to over $7.5 billion by the end of 1980, according to *EDP/Industry Report* (EDP/IR).

The portion of that installed based attributable to non-IBM mainframers will approach $2 billion by then, the report stated. IBM will have about $4.5 billion of the installed base, leaving the independents and mini makers with less than $1 billion each.

Major suppliers of small business systems fall into four categories: IBM, other mainframers, independents and minicomputer vendors, EDP/IR said.

At year-end 1975, IBM had over two-thirds of the installed units and 68.3%, or $2.14 billion, of the installed value base.

The IBM 3/10 accounted for 53.5% of the installed dollar value, while other members of the IBM/3 family accounted for 9.1%. The System 32 accounted for 5.7%.

There were 5000 System 32s, 2,750 3/6s, 1,200 3/8s and 16,700 3/10s installed at year-end 1975, according to International Data Corp. (IDC), the market research firm that publishes EDP/IR.

"IBM 3 and 32 users cite the company's service and support as their major reason for acquisition – and examine other vendors' offerings to a much lesser extent than other small system users," EDP/IR stated.

Among other mainframe manufacturers, NCR had an installed base of 1,245 machines, both Century 50s and 8200s, at year-end 1975.

Burroughs was close behind with some 1,200 Installed machines including the B700 family and B1712/14/18.

Univac rounded out the "other" mainframe group with offerings from the 9200/9300 category of which there were 1,750 installed, according to IDC estimates.

NCR totaled 3.9% of the installed dollar value, Burroughs 3.6% and Univac 8%, which gave non-IBM mainframe manufacturers a total market share of 15.5%.

(Continued on Page 34)

Independents Seem Unconcerned About Lower Priced System 32

By Molly Upton
Of the CW Staff

Several marketing executives at small business machines firms contacted recently were unaware of IBM's announcement of lower priced models of its System 32.

Most did not seem overly worried, indicating their systems either offer more for the same money or much more for a slightly higher price than the 32 A01, the lowest priced member of the 32 family [CW, June 28].

IBM is offering the A01 under the Term Availability Plan for $680/mo or $714/mo on rental. The unit has a 3.2M-byte disk and a 40 char./sec unidirectional printer rather than the 5M-byte disk and 40 char./sec bidirectional printer offered on the 32 that was previously the bottom of the line.

IBM Playing Game?

One industry source observed perhaps IBM is playing the same game some other vendors have been playing – sporting a model with an attractive price tag in order to lure customers into looking at the product line, while knowing most will select higher ticket systems because they need more capabilities.

The 32 A01 puts IBM "in the ballpark from a dollar point of view only, not from a feature point of view," according to Donald L. Schnitter, director of marketing services at Basic/Four, Inc.

Basic/Four's minimal unit has interactive capability, a 4M-byte disk and a 165 char./sec printer. It rents for under $1,000/mo and sells for $34,400, he said. The firm recently increased the minimum disk size to 5M bytes rather than 2.1M bytes.

About 99% of its customers were ordering the 4.2M-byte disk, which was available for an additional $2,000. By using 200 track/in. disks, Basic/Four increased the capacity of the 4.2M-byte unit to 5M bytes at no extra cost, Schnitter said.

"A 3.2M-byte disk usually isn't

(Continued on Page 34)

Keydata Courting Small Firms

WELLESLEY, Mass. – Keydata Corp. is courting the small business whose revenues range from $750,000 to $5 million by offering a packaged plan that reduces the minimum monthly cost of time-sharing to $800.

Designed for distribution and manufacturing firms, Keydata's System 800 plan offers billing, inventory control, accounts receivable and sales analysis as well as a variety of reports (see story on Page 17).

By packaging the plan and limiting some of the functions available under its other services, Keydata has reduced its minimum price from between $1,100/mo and $1,200/mo, according to Frank Girard, vice-president of marketing.

The System 800 was designed to give first-time users a choice, he said, noting they won't necessarily have to get a minicomputer.

The firm's customer set is principally made up of firms in the manufacturing and distribution areas whose sales are $2 million or more, he explained.

Keydata had not gone after the market with sales below $2 million very aggressively before, "but with the activity the minicomputer manufacturers have generated in that segment of the market, we feel there's a lot of opportunity for us," Girard said. "It really represents a new market for us."

Response to the plan, which the firm has been selling for about three weeks, has been "tremendous, far exceeding anything we expected," he said, adding Keydata has already booked customers.

Smaller businesses with little or no computer experience "are being inundated by sales presentations from people trying to convince them to install in-house minicomputer systems," L. Edwin Donegan Jr., Keydata president, said.

"The small businessmen who run these companies generally lack the experience to undertake the risks involved in hardware selection, software creation and the day-to-day operation of even the smallest minicomputer system," he said.

But, he noted, "these risks are more significant to them than to larger companies, since computer failures can literally put a small company out of business."

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Independents Show Little Worry Over Lower Cost 32

(Continued from Page 33)

enough," he remarked.

Wang Laboratories, Inc. offers a system with 10M bytes of disk and a 200 char./sec printer for slightly over $30,000, according to Ned Chang, marketing vice-president.

Concern Over Long Term

Chang is not overly concerned about IBM in the short term, "but you always worry about the long-term effects of what it does," he said.

"In the short term [IBM hasn't] been a problem for us yet," he added.

In pondering IBM's recent version of the 32 for word processing, Chang said it looked like IBM was trying to get more marginal business on the 32.

"The systems are not the same as ours at all," he commented, adding Wang's philosophy has been that most people using word processing will use it on a dedicated basis.

"It's not normally productive to tie up a computer console," he commented, but "it's possible IBM may find a bunch" of such users.

"It's really more cost-effective for us to look for customers of $12,000 to $18,000 dedicated word-processing systems. There are many more of those people," he said.

Chang said he sees IBM as being more or less "locked in" to its rental base of 150,000 to 180,000 word-processing systems so it can't radically change technology at the same price very fast.

IBM has "to go at it relatively slowly. It looks to me like with the 32 It's starting at the top end of that and working its way down slowly."

Noel Kile, vice-president of marketing for Qantel Corp., said the lowest model of the 32 adds a lot more credibillty to the market, just as the original 32 announcement did.

Qantel offers more for less money than IBM, Kile said. A Qantel system with a 6M-byte disk and 45 char./sec bidirectional printer sells for $22,500. A communications option is available on the system.

G.P. Williamson, an NCR marketing vice-president, said the lower model of the 32 broadens IBM's spectrum of competition. "I think you have to look at that on an industry-by-industry basis to assess what the impact is going to be," he added.

A possible motivation for IBM's introduction of the product, he suggested, is to "get down to an account that is more what it originally intended for the 32."

This would give the users some room to grow on the system, Williamson said. In some cases it is possible that full implementation of the Industry Application Programs on a 32, as might be the case with larger users, could mean the system was running at or very near capacity shortly after installation, he noted.

"The size account the 32 could be implemented in was probably smaller than IBM orignally projected," he observed.

Williamson said he doesn't see much effect on either the NCR 8200 or the 499.

The 8200, with its interactive applications, offers head-to-head competition, although generally its price tag is slightly more than the 32.

"But it's a totally different concept of DP," he added, since the 8200 is an interactive, on-line data base-oriented system. The 32 is batch-oriented with inquiry and data capture capabilities, he said.

"Our indication is that the market likes interactive capabilities," he said. "I think the entry-level user would rather have a more complete, easy-to-use system than a batch-oriented system that involves many changes of floppies."

Minimum rental of an 8200 is $1,200/mo and purchase prices are in the $40,000 to $50,000 range. The 8200 handles up to seven terminals, with 5M- to 40M bytes of disk and an operating system that handles up to seven jobs simultaneously, he said.

NCR's 499, at the low range of the 32, is oriented to the user who wants a visible record and sells for $15,000 to $25,000. Williamson said he doesn't see the 32 having a tremendous effect on this market.

Small Business Mart To Grow 20%/Year

(Continued from Page 33)

"In cases where users considered more than one supplier when they acquired their [small business] system, one of the competing vendors was a non-IBM mainframer 55% of the time," according to EDP/IR.

Main Competitors

Singer and Basic/Four are the main competitors in the independent area.

With 1,950 System Tens installed, Singer boasted 6.8% of the installed market value, while 1,000 installed 350s, 400s and 500s give Basic/Four 1.6% at year-end 1975.

Wang's WCS 20 and WCS 30 and Qantel's 800, 900/1100 and 1200 machines accounted for a total of 1.1% of the market value.

Lockheed and Microdata were among the minicomputer vendors who had found ways – primarily through systems houses and distributorships – to wrap their systems in enough software and applications packages to turn them into small business systems, EDP/IR stated.

Lockheed had .5% and Microdata .3% of the market value. Digital Equipment Corp., with its 300 and 500, held 2.4% of the installed value.

Among the most likely buyers of small business systems – companies with sales less than $25 million – almost twice as many companies did not use an in-house computer as those who did, IDC found.

Of the noncomputer users, about 40% used an outside service bureau, 30% used only manual methods and 20% used accounting machines.

Of the computer users, over 60% used just a computer while 25% used a computer and a service bureau.

Nearly 20% of small business computer installations supplanted sevice bureau usage, while 75% replaced either manual methods or accounting machine methods.

In only about 5% of the instances did small business computers replace another computer, the report showed.

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Core Memories Face Phaseout

Dataproducts Concentrating on Printers

By Esther Surden
Of the CW Staff

WOODLAND HILLS, Calif. – Dataproducts Corp., which once was a multiple peripheral company, has almost entirely phased out its extraneous business and is concentrating on the printer marketplace, according to Irving L. Wieselman, vice-president of product programs.

The only other significant factor in the firm's product line is core memories which, Wieselman said, can still be cost-effective in the larger sizes. These will also be phased out, he indicated.

The firm is embarking on production of matrix printers as well as its traditional line printers, he said.

Dataproducts sells the printers as an OEM to such firms as Digital Equipment Corp., Hewlett-Packard, Basic Four and Olivetti, with no one of its customers having more than 15% of the business, Wieselman said.

Similar Markets

The markets the matrix printers would serve would be similar to the firm's traditional markets, Wieselman said, because mini users need both the line printer and the less expensive, slower matrix type, depending on customer applications.

These would include the small business market, terminals and the lower end of the mini lines, he said.

Dataproducts has seen a trend towards lower cost and higher reliability in line printers dictated in part by the OEM customers.

"As more systems went out, it became more costly for the OEM to do maintenance," Wieselman explained. The firm has responded by developing technology that uses as few mechancial parts as possible and minimizes points of wear.

Family Concept

The firm has also been working toward a family concept in printers, he said, to minimize spares requirements. "Although we pioneered it, General Electric and Control Data Corp. have adopted this concept. Users have dictated this approach," he said.

Dataproducts' Mark IV Hammerbank is mounted on a flexible pivot and is servo-driven via coil positioner, Wieselman said. An optical transducer is used for positioning and a magnetic transducer is used for velocity sensing.

In Dataproducts' Charaband printer, a metallic-type module with two characters in the type face is inserted into the cylindrical receptacle of a type slug. The slug, attached to the band, becomes the carrier of the type.

The band is driven by a pulley which, in turn, is motor-driven, and the Charaband font carrier rides on ball bearings; magnets also constrain the band. This reduces the need for lubrication, Wieselman said, noting most train printers need complex lubrication.

The firm has also used a microprogrammed processor architecture in its line printers to help control the printing, he added.

Firm OEMing Parts

WOODLAND HILLS, Calif. – Dataproducts Corp. has entered into the OEM component area by marketing components of its line printers.

The firm has begun selling its Mark IV Hammerbank and Charaband horizontal font carrier for OEM purchase on a worldwide basis.

Dataproducts is offering the Hammerbank in either complete assemblies or customized modules for column, label or tag printing as well as for other specific applications.

Detachment, Concern In Range of Reaction To IBM 3/15D News

Reactions from makers of machines that compete with the IBM 3 ranged from relative indifference to an acknowledgement the recently introduced Model 15D [CW, June 28] will make IBM more competitive against independents.

Bill Krause, marketing manager for Hewlett-Packard Co.'s (HP) General Systems Division, said the 3/15D will make it more difficult for HP's 3000 line to compete against IBM, although the 3000s have a considerable price advantage.

When users previously outgrew their 3s, they had to leave the IBM fold unless they wanted to go to a 370, he said. Now IBM offers a machine with a higher performance capability to those users who want to stay with IBM.

Expected a Bridge

Krause was a bit surprised at the announcement's "lack of punch," he said, because he was expecting IBM to announced a bridge system between the 3 and the 370 or a replacement for the 3.

"It's an awkward attempt to make a bridge computer," he said.

Krause views the 15D as an attempt to halt the erosion of the 3 base as HP and others have been luring away users who had outgrown it.

Donald W. Fuller, president of Microdata Corp., said the 15D still doesn't have the kind of software features needed to serve the market looking for data base applications.

In comparable configurations, the Microdata Reality costs less than the 15D and its software is more powerful, he said.

"So far I haven't seen anything in software that really makes a giant step forward where [users] can really use the machine in inventory control applications," he said.

"But you can't ignore the trend," he added.

IBM is offering more and more low-end machines as it nibbles away at that marketplace, he said, but he thinks it will be quite some time before IBM offers virtual capability on the System/3.

William R. Doniger, executive vice-president of Mini-Computer Systems, Inc., said the 3/15D "doesn't bother us. It's a big world and we're getting our share. There's plenty of demand."

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Systems Planning & Development

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These positions are located in Marathon's Generel Office in Findley, Ohio, and offer a salary commensurate with education and experience end a complete benefits package.

Interested? Pick up the phone NOW and cell this number collect 419-424-0030. It will take just a few minutes of your time (we will accept calls from 8 a.m. to 4 p.m. eastern daylight time weekdays and from 1 p.m. to 4 p.m. eastern daylight time on Saturdays and Sundays.) Principals only, no agencies!

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Barbara Harder
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These positions involve assignments in systems development. Responsibilities include the conception of new systems and the design, analysis and simulation of these systems. Activities will center ebout microprocessor-minicomputer systems; developing effective financial business systems; developing end simulating data communications schemes; the development and implementation of software and hardware architecture to satisfy the system requirements.

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Wine division of Fortune 500 computer products company has immediate opening for individual with solid technical deta processing experience end treining, including good experience in programming end computer operations with 360/370 systems. Good commend of DOS/VS JCL. Supervise functionel areas of computer operations including data input, scheduling, library, computer end peripheral equipment. Responsibilities will also include directing the lleison activities of computer operations releting to various MIS end user departments. Excellent fringe benefits end growth opportunities. We ere en equal opportunity employer male and female. Please send your detailed resume including salary history and requirement to this paper.

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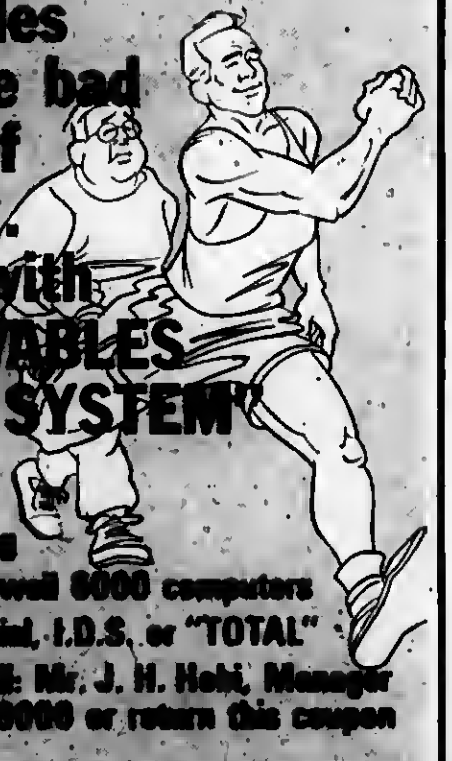

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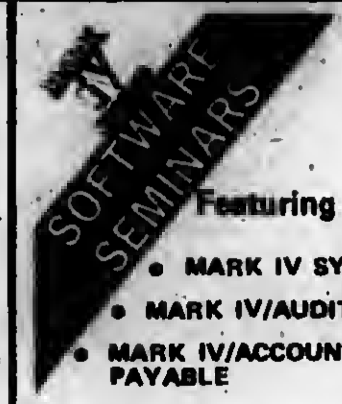

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DCC Gains

FAIRFIELD, N.J. – Digital Computer Controls, Inc.'s (DCC) earnings for the first quarter ended May 31 were $495,725 or 32 cents a share compared with earnings of $89,462 or 6 cents a share in the year-ago period.

Sales reached $4.8 million compared wtih $2.3 million.

For the year ended Feb. 29, DCC earned $625,262 or 40 cents a share, up from $230,697 or 15 cents a share.

Dataproducts 1976 Net Sets Record

WOODLAND HILLS, Calif. – Dataproducts Corp.'s fourth-quarter and 1976 earnings set records for the company.

Fourth-quarter earnings climbed 44% to $2.2 million or 30 cents a share compared with $1.5 million or 22 cents a share in the year-ago period, which included a $199,000 charge from expenses of Data Card Corp.

The 1975 periods were restated to treat Data Card as an unconsolidated subsidiary, the firm said.

Revenues in the quarter climbed to $23.4 million compared with $20.7 million in the same period last year.

For the year, Dataproducts earned $7.1 million or 98 cents a share compared with $5.8 million or 85 cents a share last year.

There was a $1.1 million credit during 1976 from the sale of Data Card stock while 1975 included a charge of $778,000 from Data Card. In June 1975, Dataproducts reduced its holdings in Data Card from 66% to 26%.

Revenues for the year declined sllghtly to $85.1 million compared with $85.9 million last year.

"All elements of the business contributed to profitability in each quarter of the year," according to President Graham Tyson.

Backlog at year end was $48.6 million compared with $37.3 million a year earlier.

"The major markets we serve appear to have recovered from the recession," he said.

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Earnings Quintuple in Nine Months, Grow Threefold in Quarter at SDC

SANTA MONICA, Calif. – System Development Corp. (SDC) saw its earnings grow five-fold in the nine months and more than triple in the third quarter.

During the nine months the firm earned $1.4 million or 75 cents a share compared with $243,000 or 13 cents a share in the year-ago period.

Revenues declined slightly to $79.3 million in the nine months ended March 28 compared with $79.5 million in the same perlod last year.

For the quarter, earnings totaled $498,000 or 27 cents a share compared with $144,000 or 8 cents a share in the same 1975 period.

Revenues declined to $27.7 million compared with $27.8 million in the year-ago quarter.

The rise in third-quarter earnings resulted primarily from improved profitability of domestic operations aided by reduced losses from foreign operations and reduced interest charges, according to George E. Mueller, SDC chairman.

During the quarter, SDC acquired Moll Associates, Inc., which will operate as its financial data services division.

Fabri-Tek Reduces Loss for Year

MINNEAPOLIS – Fabri-Tek, Inc.'s 1976 revenues declined, but so did its loss for the year ended April 2.

The memory maker's revenues dropped to $28.9 million compared with $35.3 million in 1975.

Losses totaled $1.5 million or 42 cents a share, down from $1.7 million or 46 cents a share last year.

"The reduced revenues were experienced largely in the core memory areas of our business, which is ticd very closely to the capital equipment segment of the economy," L.D. Altman, Fabri-Tek president, explained.

The firm's National Connector Division and Digiac, an educational systems subsidiary, both improved in revenues.

"Although the year was very disappointing, order volume for the first quarter of the current fiscal year was up significantly and we anticipate that shipments will rise steadily throughout the year," he said.

Wang Net Shows Jump In Nine-Month Period

TEWKSBURY, Mass. – Aided by a sizable jump in third-quarter earnlngs, Wang Laboratorles, Inc.'s nine-month earnings rose to $3.3 million or 64 cents a share from $1.8 million or 35 cents a share in the same period last year.

Revenues for the nine months reached $65.2 million compared with $51.3 million in the year-ago period.

For the third quarter, earnings climbed to $1.1 million or 21 cents a share compared with $170,000 or 3 cents a share in the same period last year.

The earnings jump occurred while revenues rose to $22.9 million compared with $17.4 million in the year-ago period.

Total backlog on March 31 was $14.2 million compared with $11.2 million a year ago.

New Registrations

AMDAHL CORP., 1250 E. Arques Ave., Sunnyvale, Calif. 94086, a computer manufacturer, filed to register 1 million sharas of common, of which 928,000 are being sold by the company. The First Boston Corp., 20 Exchange Place, New York, N.Y. 10005 is tha underwritar.

...Toward the Bottom Line

$$$

Inter-Continental Computing reported a loss of $189,308 in the first quarter resulting primarily from a decline in revenues from its casualty insurance software subsidiary.

$$$

Advanced Computer Techniques declared a dividend of 5 cents a share on fiscal 1976 results payable Aug. 20 to shareholders of record July 2.

$$$

Prudential Insurance Co. of America has approved a $1 million loan to T-Bar in the form of a 15-year note at 11.25%. Proceeds will be used to refund existing bank loans and for additional working capital.

$$$

Storage Technology declared a 6% stock dividend payable July 2 to stockholders of record June 4.

$ $ $

Mathematica declared a regular semiannual cash dividend of 10 cents a share payable June 25 to shareholders of record June 1.

$ $ $

Conrac will pay its first stock dividend, 10%, on July 30 and increase the regular quarterly cash dividend to 20 cents a share payable Sept. 15 to holders of record Aug. 30. The previous dividend was 17.5 cents a share.

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IBM has named Salomon Brothers of New York City as independent brokers in purchasing IBM stock for the IBM Employees Stock Purchase Plan that began July 1.

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ANNUAL MEETING

The Four Phase Users Association cordially invites all Four Phase Users to attend their annual meeting to be held August 18-20 in Cupertino, California.

For additional information, please contact Mr. Phil Shapiro – President, by July 23, 1976 at:

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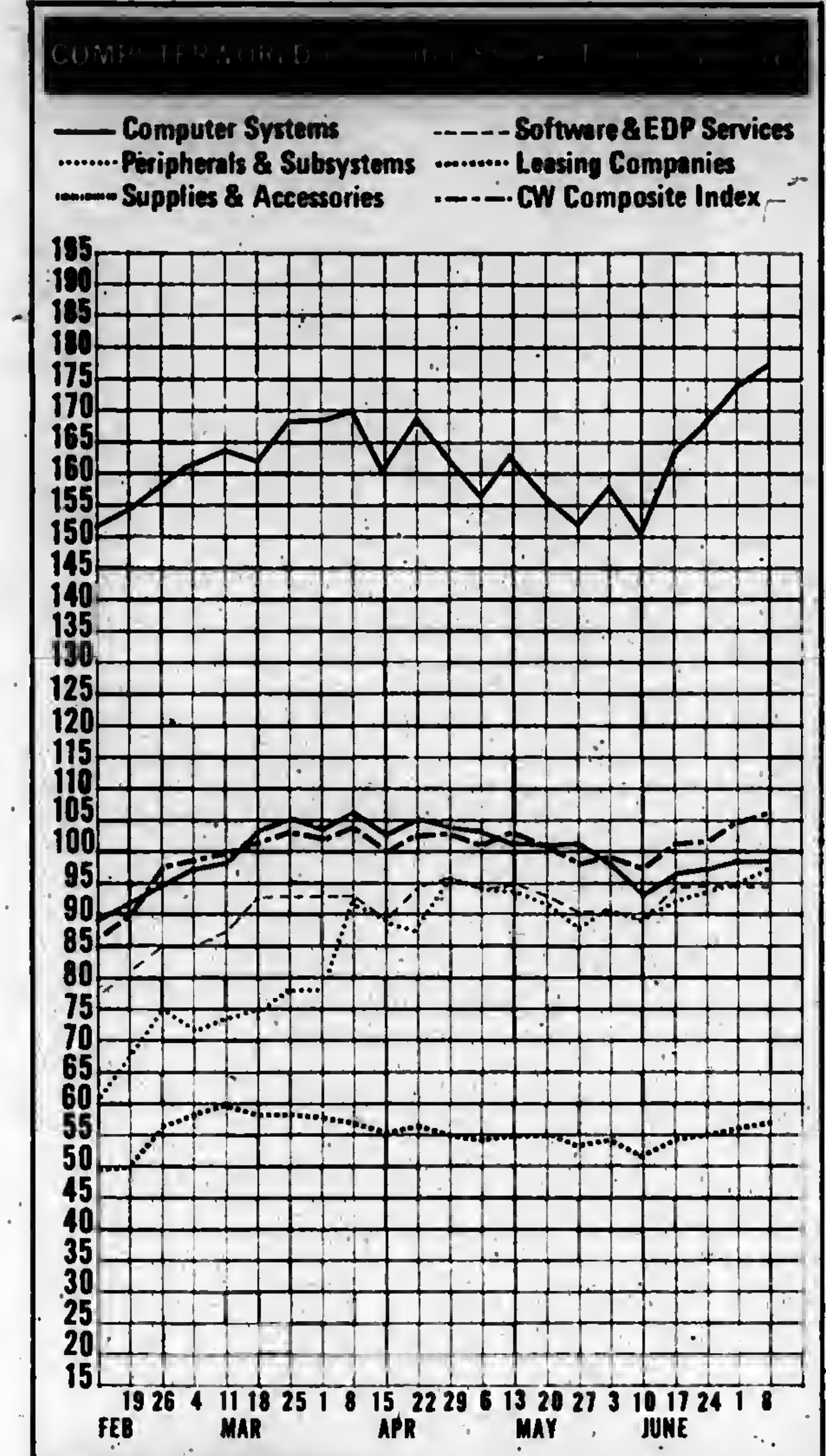

Earnings Reports

MICRODOT

Three Months Ended March 28

	1976	1975
Shr Ernd	$.76	$.69
Revenue	81,971,000	80,547,000
Earnings	3,089,000	3,027,000

MODULAR COMPUTER SYSTEMS

Three Months Ended March 31

	1976	1975
Shr Ernd	$.10	$.19
Revenue	9,811,000	8,672,000
Earnings	280,000	548,000

PRIME COMPUTER

Three Munths Ended April 4

	1976	1975
Shr Ernd	$.16	$.03
Revenue	3,957,000	2,226,000
Tex Cred	177,000	27,000
Eernings	365,000	52,000

NATIONAL COMPUTER SYSTEMS

Year Ended Jan. 31

	1976	1975
Shr Ernd	$1.02	$.73
Revenue	9,108,100	8,018,000
Earnings	606,800	433,200

PROGRAMS & ANALYSIS

Three Months Ended Merch 31

	1976	1975
Shr Ernd	$.04	$.01
Revenue	909,465	711,956
Eernings	35,576	5,048

SCIENTIFIC SOFTWARE

Three Months Ended Merch 31

	1976	1975
Shr Ernd	$.13	$.12
Revenue	1,644,527	1,009,017
Tex Cred	68,672	72,905
Eernings	162,395	153,130

STANDARD COMPUTER

Three Months Ended Merch 31

	1976	1975
Shr Ernd	$.37	$.04
Revenue	1,614,000	1,541,000
Earnings	220,000	22,000

MATHEMATICA

Three Months Ended Merch 31

	1976	1975
Shr Ernd	$.21	$.10
Revenua	5,161,700	3,697,100
Earnings	147,300	72,700
9 Mo Shr	.64	.59
Revenue	13,049,300	10,755,600
Earnings	447,000	414,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 7, 1976

All statistics compiled, computed and formatted by
TRADE★OUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE			
		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	101 5/8	-2 3/8	-2.2
O	COMPUTER AUTOMATION	10- 19	18 1/8	- 3/4	-3.9
N	CONTROL DATA CORP	18- 27	24 1/4	+ 5/8	+2.6
N	DATA GENERAL CORP	40- 60	53 7/8	- 3/4	-1.3
O	DATAPOINT CORP	24- 46	44 3/4	+ 1/2	+1.1
O	DIGITAL COMP CONTROL	2- 7	7 1/8	+ 3/4	+11.7
N	DIGITAL EQUIPMENT	138-181	178	+1 1/4	+0.7
N	ELECTRONIC ASSOC.	2- 5	2 3/4	- 1/8	-4.3
A	ELECTRONIC ENGINEER.	7- 16	12 1/8	- 1/8	-1.0
N	FOXBORO	28- 46	42 1/2	-1 1/2	-3.4
O	GENERAL AUTOMATION	5- 11	7 1/4	- 1/4	-3.3
O	GRI COMPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	HEWLETT-PACKARD CO	95-117	116 5/8	+1 7/8	+1.6
N	HONEYWELL INC	34- 56	50 3/4	+1 1/8	+2.2
N	IBM	227-278	278	+1 1/4	+0.4
O	MANAGEMENT ASSIST	1- 3	2	+ 1/8	+6.6
O	MEMOREX	18- 33	31 3/4	+2	+6.7
O	MICRODATA CORP	10- 26	26	+1 3/4	+7.2
C	MODULAR COMPUTER SYS	9- 14	12 1/2	- 1/4	-1.9
N	NCR	24- 35	34 5/8	0	0.0
O	PRIME COMPUTER INC	4- 12	12	+2	+20.0
N	PERKIN-ELMER	19- 27	23 7/8	+ 3/8	+1.5
N	RAYTHEON CO	45- 62	62	+2 1/4	+3.7
N	SPERRY RAND	40- 51	50 3/4	- 1/2	-0.9
O	SYCOR INC	20- 31	26 1/4	-1 1/4	-4.5
A	SYSTEMS ENG. LABS	6- 10	8 7/8	-1	-10.1
N	VARIAN ASSOCIATES	13- 17	15 1/2	- 1/8	-0.7
A	WANG LABS.	11- 20	16 1/8	+ 3/8	+2.3

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	6	- 1/4	-4.0
A	COMMERCE GROUP CORP	2- 3	2 3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	0	0.0
M	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	+	+10.0
N	DPF INC	5- 8	7 5/8	+ 3/8	+5.1
A	GREYHOUND COMPUTER	3- 8	7 1/2	0	0.0
N	ITEL	6- 14	13 7/8	+ 1/8	+0.9
N	LEASCO CORP	6- 14	14	+ 1/4	+1.8
O	LEASPAC CORP	0- 1	1/4	0	0.0
C	NRC INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/8	- 1/8	-1.6
N	U.S. LEASING	7- 12	10 7/8	+ 7/8	+8.7

EXCH: N=NEW YORK, A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; C=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE			
		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	- 1/8	-8.3
O	ANACOMP INC.	9- 11	9	+ 1/8	+1.4
A	APPLIED DATA RES.	2- 4	3 3/8	+ 1/8	+3.8
N	AUTOMATIC DATA PROC	17- 35	33 3/8	- 1/4	-0.7
O	COLEMAN AMERICAN COS.	3- 6	3 1/8	0	0.0
C	COMPUTER DIMENSIONS	3- 7	4 1/2	- 1/4	-5.2
C	COMP ELECTION SYSTMS	5- 9	7 1/4	0	0.0
C	COMPUTER HORIZONS	1- 2	2 1/4	+ 1/4	+12.5
O	COMPUTER NETWORK	2- 6	3 1/2	- 3/8	-9.6
N	COMPUTER SCIENCES	4- 8	7 1/8	+ 1/8	+1.7
O	COMPUTER TASK GROUP	1- 1	1 3/8	+ 1/8	+10.0
O	COMPUTER USAGE	3- 6	3 1/2	0	0.0
C	COMSHARE	2- 9	7	- 1/4	-3.4
O	DATA DIMENSIONS INC	2- 4	3 3/8	- 1/8	-3.5
C	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	13	+ 5/8	+5.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 2	1 3/4	+ 1/8	+7.6
C	IPS COMPUTER MARKET.	1- 2	1 1/8	+ 1/8	+12.5
O	KEANE ASSOCIATES	2- 4	3	0	0.0
O	KEYDATA CORP	2- 5	2 3/4	+ 1/8	+4.7
O	LOGICON	4- 4	3 5/8	- 1/8	-3.3
A	MANAGEMENT DATA	1- 2	2 1/8	0	0.0
A	NATIONAL CSS INC.	13- 29	23 1/2	+1 1/4	+5.6
A	ON LINE SYSTEMS INC	18- 22	19 7/8	+1 7/8	+10.4
N	PLANNING RESEARCH	3- 5	4 1/4	+ 1/2	+13.3
O	PROGRAMMING & SYS	1- 1	3/8	- 1/8	-25.0
O	RAPIDATA INC	3- 5	2 3/4	0	0.0
C	REYNOLDS & REYNOLDS	13- 21	16 1/4	+ 1/2	+3.1
C	SCIENTIFIC COMPUTERS	1- 1	1/2	- 1/4	-33.3
O	TYMSHARE INC	19- 28	25 3/8	+ 1/4	+0.9
A	URS SYSTEMS	3- 5	4	+ 1/4	+6.6
N	WYLY CORP	2- 7	2 3/4	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 3/4	- 1/4	-2.5
O	ADVANCED MEMORY SYS	4- 10	7 3/8	- 3/8	-4.8
N	AMPEX CORP	5- 9	8 1/2	- 1/8	-1.4
O	ANDERSON JACOBSON	2- 4	3 1/8	+ 1/4	+8.6
C	APPLIED DIG DATA SYS	13- 25	25 1/4	+ 3/4	+3.0
O	BEEHIVE MEDICAL ELEC	3- 9	7 3/4	0	0.0
A	BOLT,BERANEK & NEW	7- 11	10	- 1/2	-4.7
N	BUNKER-RAMO	5- 9	9 3/8	+ 3/8	+4.1
A	CALCOMP	4- 7	5 3/4	- 1/8	-2.1
O	CAMBRIDGE MEMORIES	2- 6	2 3/8	+ 1/8	+5.5
N	CENTRONICS DATA COMP	20- 36	32 3/4	+1 1/4	+3.9
O	CODEX CORP	22- 42	29 1/2	-2 1/2	-7.8
O	COGNITRONICS	1- 1	7/8	0	0.0
C	COMPUTER COMMUN.	1- 5	3 3/4	+ 1/8	+3.4
C	COMPUTER CONSOLES	4- 7	5 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER TRANSCEIVER	1- 3	1 1/8	+ 1/8	+12.5
C	COMTEN	4- 9	8	+ 1/4	+3.2
A	CONRAC CORP	20- 25	21 5/8	- 1/4	-1.1
O	DATA ACCESS SYSTEMS	1- 4	3 1/2	0	0.0
O	DATA 100	7- 13	9 1/2	+ 3/8	+4.1
A	DATA PRODUCTS CORP	5- 13	12 7/8	+1 1/8	+9.5
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC.	1- 2	2 1/4	0	0.0
C	DECISION DATA COMPUT	1- 4	2	0	0.0
O	DELTA DATA SYSTEMS	1- 1	3/4	+ 1/8	+20.0
N	ELECTRONIC M & M	1- 3	2 1/2	0	0.0
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
C	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/4	0	0.0
N	HARRIS CORP	34- 49	48 1/2	- 3/4	-1.5
A	INCOTERM CORP	5- 20	12 1/4	+ 1/8	+1.0
O	INFOREX INC	2- 7	3 7/8	- 1/4	-6.0
O	INFORMATION INTL INC	10- 18	13 1/2	- 7/8	-6.0
C	INTEL CORP	60-109	69	+1 1/2	+2.2
A	LUNDY ELECTRONICS	4- 7	4 1/2	- 1/8	-2.7
C	MSI DATA CORP	3- 7	6 3/4	+ 1/2	+8.0
A	MILGO ELECTRONICS	15- 21	19 1/4	- 5/8	-3.1
N	MOHAWK DATA SCI	3- 9	8 3/4	+1	+12.9
O	PENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	5 3/4	- 3/8	-6.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	7- 10	9	0	0.0
C	QUANTOR CORP	4- 5	5 1/8	+ 1/2	+10.8
C	RECOGNITION EQUIP	6- 11	9 1/4	- 1/8	-1.3
N	SANDERS ASSOCIATES	6- 11	9 3/8	- 1/2	-5.0
O	SCAN DATA	2- 4	2 1/8	0	0.0
O	STORAGE TECHNOLOGY	5- 13	10 7/8	- 3/8	-3.3
C	T BAR INC	5- 10	9 5/8	+ 1/8	+2.2
O	TALLY CORP.	4- 6	5	0	0.0
C	TEC INC	3- 5	3 1/2	0	0.0
N	TEKTRONIX INC	45- 64	62 1/4	-1 3/4	-2.7
N	TELEX	2- 5	3 3/4	- 1/4	-6.2
O	WANGCO INC	11- 22	21 1/8	+ 3/8	+1.8
O	WILTEK INC	2- 2	3 1/8	+ 5/8	+25.0

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/8	+ 1/8	+4.1
O	BALTIMORE BUS FORMS	4- 5	3 1/2	0	0.0
A	BARRY WRIGHT	6- 10	7 7/8	- 1/8	-1.5
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	32- 42	35 3/4	+ 1/4	+0.7
O	DUPLEX PRODUCTS INC	15- 24	14 3/4	0	0.0
N	ENNIS BUS. FORMS	6- 9	6 3/4	+ 1/8	+1.8
C	GRAHAM MAGNETICS	8- 13	8 1/2	+ 1/2	+6.2
O	GRAPHIC CONTROLS	13- 19	14 3/4	- 1/4	-1.6
N	3M COMPANY	53- 65	57 7/8	+2 1/4	+4.0
O	MOORE CORP LTD	40- 51	40 1/2	+ 1/4	+0.6
A	NASHUA CORP	11- 17	15 5/8	- 1/4	-1.5
O	STANDARD REGISTER	15- 19	15 1/2	0	0.0
O	TAB PRODUCTS CO	5- 10	9 1/2	- 1/4	-2.5
N	UARCO	21- 25	21	- 1/8	-0.5
A	WABASH MAGNETICS	4- 8	7 3/8	- 3/8	-4.8
N	WALLACE BUS FORMS	19- 25	15 5/8	+ 1/8	+0.6

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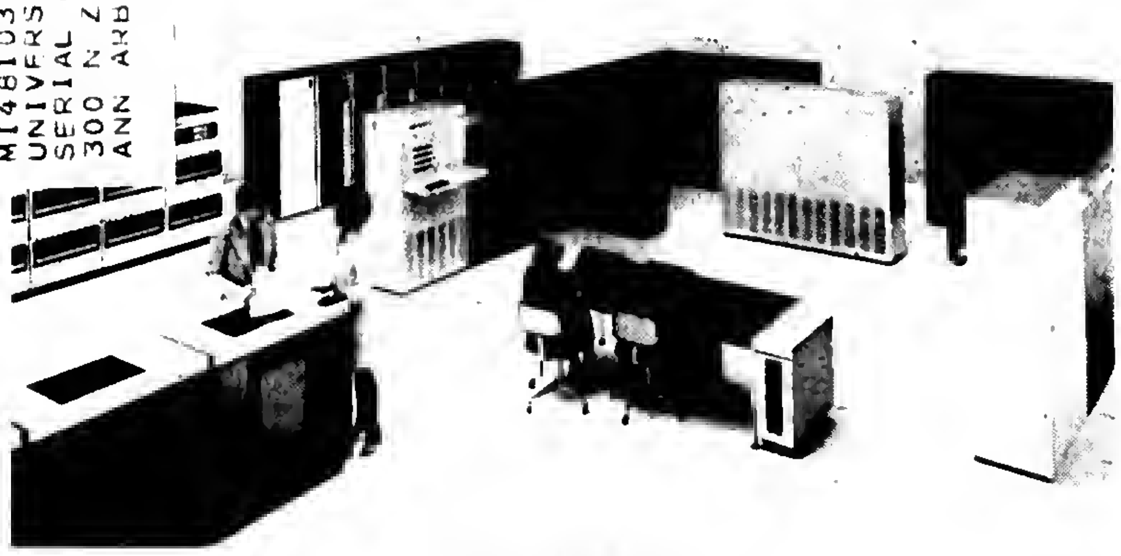
NEWSPAPER

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.

ear July 19, 1976 Vol. X, No. 29



Burroughs B6821

Burroughs Doubles Power Of B6700s in 800 Models

By Esther Surden
Of the CW Staff

DETROIT – The introduction of the Burroughs Corp. B6800 last week extended upwards the firm's 800 family of large-scale systems with three models said to provide twice the throughput of the B6700 systems.

The latest members of the 800 family are the B6807 and B6811 designed for decentralized DP applications and the B6821 designed to operate as a central system in a large network. They are in the range of the IBM 370/138, 148 and 158, Burroughs said.

Intended as upgrades from the B6700 systems, the B6800 systems are object code-compatible with the firm's B6700 and B7700 systems, a Burroughs spokesman said.

The systems are not compatible, however, with the less powerful members of the 800 family. The B2800, B3800 and B4800 have different CPUs than the B6800s, and programs running on these systems must be recompiled to run on a B6800, the spokesman said.

The B6807 and B6811 each include a single CPU and single I/O processor. The B6821 features dual CPUs and dual I/O processors. The B6811 and B6821 with "optimized memory logic" can access memory twice as fast as the B6807, the spokesman claimed. The memory access logic can be upgraded in the field, he noted.

Larger Configuration Possible

The B6800 systems can be combined to form an even larger configuration with up to four CPUs, four I/O processors, 16 data communication processors and up to 15M bytes of directly addressable memory, Burroughs said.

The B6800s' increased performance is derived from a faster cycle time, a look-ahead feature that enables the system to simultaneously fetch and execute object code and larger buffers in the B6800 I/O subsystem than the B6700, the spokesman said.

The B6800 CPU has a 150-nsec cycle time. Memory is core that can be two-way interleaved and is configured on circuit boards. The memory has a read access time of 325 nsec for 6 bytes, Burroughs said.

A major feature of the multiple CPU configurations is Global memory introduced for the B6800 systems. Each CPU can have up to 3M bytes of main memory for its exclusive use. Also, 3M bytes of common Global memory can be shared

(Continued on Page 6)

CBS Was Ready and Waiting... But Delegate Profiles Unneeded

By Nancy French
Of the CW Staff

NEW YORK – Had last week's Democratic National Convention been a contest like the Republicans' is going to be, CBS-TV could have projected the voting behavior of every delegate with a computer data base it compiled weeks before the convention even started.

The CBS Election and Survey Unit interviewed every convention delegate and stored those profiles in a data bank accessible via portable terminals near the convention floor, according to Warren Mitofsky, director of the unit.

CBS has been using computers for years to help bring viewers more detailed coverage of national conventions, but this is the first time its computer also has been programmed to count roll call votes, he said.

For this function, CBS' IBM 370/155 recorded and tabulated votes and then output the results to a minicomputer-driven character generator which projected the numbers right on viewers' TV screens.

To build the data base, CBS interviewers contacted every convention delegate and asked each a series of about 40 questions. News analysts wanted to know delegates' demographic characteristics – race, sex and nationality, for example – as well as their positions on the issues, Mitofsky said.

Since last week's chief unknown concerned the selection of a vice-presidential candidate, "we also wanted to know which vice-presidential contenders the delegates supported and which candidates they could not support," he said.

"In the case of a contested convention we would have found out how the delegates were selected, if they were uncommitted or pledged to a candidate and what they were going to do on the first ballot regardless of how they were selected," he said.

(Continued on Page 4)

Georgia Backlog Blamed on Forms

Medicaid System Falls $20 Million Behind

By Catherine Arnst
Of the CW Staff

ATLANTA – Claims forms that cannot be read by its optical scanner and a number of minor conversion problems have combined to backlog Georgia's Medicaid payments to providers by two to three months.

The Department of Administrative Services (DAS), which handles the DP requirements for Medicaid, is approximately $18 million to $20 million behind in its payments – and it will take three and one half to four months to catch up, according to Sam Thurmond, Georgia's Medicaid director.

DAS processes 150,000 to 180,000 Medicaid claims per week; payment is supposed to be made within a month of receiving the claim.

The state has been "plagued with conversion problems" which resulted in the backlog, Thurmond said. In December Georgia switched from a straight payment system running on an IBM 360/50 to a Medicaid Management Information System (MMIS) implemented on a Univac 1110.

The MMIS was modeled after a general system designed by the U.S. Department of Health, Education and Welfare. Georgia received federal funds for 90% of the developmental costs and 75% of the operational costs by going to an MMIS.

The IBM system was eight years old and "antiquated," Thurmond said. "At this time last year, we were just as backed up in our payments, and we were backed up with nursing home payments as well," he recalled.

Claims Forms Too Big

Georgia made its first Medicaid payments with the MMIS in March. The problems started in mid-April, Thurmond said.

One of the major causes of the current backlog is the new claims form designed for the MMIS. Too thick and too wide to be read by the IBM 1288 optical scanner the state uses, the form has to be keypunched into the CPU by an outside firm hired to do the job.

In addition, it takes providers approximately two times longer to fill out the new form than the old one because more data is required, according to Roger Lane, executive vice-president of the Georgia Pharmaceutical Society (GPS).

"We knew the form wouldn't work," Lane said, adding GPS pointed this out to the state in four separate meetings held before the MMIS was implemented.

Besides being too wide to fit into the

(Continued on Page 2)

Appellate Court Today Hearing IBM Beef Over Trial Documents

By Edith Holmes
Of the CW Staff

NEW YORK – A federal appeals court here will once again enter the antitrust fray between the U.S. government and IBM when it hears arguments today on IBM's claims of protection for some 20,000 documents.

At two this afternoon, the U.S. Court of Appeals for the Second Circuit will listen to attorneys for both sides debate Judge David N. Edelstein's order that directed IBM to produce the documents for the Department of Justice.

Edelstein, the U.S. district court judge who is conducting the U.S. vs. IBM antitrust trial without a jury, rejected IBM contentions that these documents are either materials prepared specifically for this trial or privileged under the special attorney-client relationship [CW, June 7].

Charging Edelstein is propounding a new theory of law by refusing to protect these documents, IBM said his decision will mean they will be put in the public record, thus permitting their use in the antitrust cases on the West Coast brought against IBM by California Computer Products, Inc. and Memorex, among others.

"The harm to defendant both in having opposing counsel view those documents and having them admitted into evidence will be massive and irrevocable," IBM

(Continued on Page 7)

Center to Aid Sharing Of Federal Software

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The Federal Software Exchange Center (FSEC), intended to foster sharing of programs between federal agencies, is now becoming operational under the General Services Administration (GSA) Automated Data and Telecommunications Service.

Outlined in a Federal Property Management Regulation (FPMR 101-32.16) issued last February, FSEC's stated goal is to reduce "overall costs, time and use of personnel resources for software acquisition and/or development."

The FPMR calls for the pooling of information of "common use software" by all federal agencies "having [DP] facilities, resources or requirements."

(Continued on Page 6)

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. **W. Germany:** Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11, Phone: 36-40-36/37. Telex: 5215350. **Asia:** Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141 Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except, a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.
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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700

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Test of New System Finds

Woman Dead Three Years Gets Medicaid

By Catherine Arnst
Of the CW Staff

COLUMBUS, Ohio – When the Ohio Welfare Department started testing a new computerized system for making Medicaid payments to nursing homes, it discovered its old system had been making payments for three years for a woman who died in 1973.

This error, amounting to $13,489, was the largest one found in the payment system the state had been running for the past eight years on an RCA Spectra computer, according to Nick Boston, chief of Ohio's Bureau of Public Assistance.

The Ohio Welfare Department is currently implementing a new nursing home payment system that will have "far more extensive edits than the previous one," Boston said. Slated to be fully operational in October, it will be run on an IBM 370/158 or 168 at the state's central DP center.

With the old payment system, "the machine was doing very little. There was a lot of dissatisfaction with it; too much of the work was done manually," Boston said.

There was also no way to check for errors. Audits were made only of payments and not of eligibility, and the system did not interface with any other public assistance systems in the state.

There was also no inspector on the county level checking nursing homes except for an occasional check by federal or state agencies, according to Lois Floyd of the county welfare office's Fraud Inspection Unit.

The department handling nursing home payments employs six people whose function with the old system was to manually prepare the data for the computer.

Error Checking 'Fell Flat'

When the woman who was receiving the payments died, she was mistakenly recorded as having moved to the Wiggins Nursing Home in Oberlin, although she had never lived there.

"There were a couple of ways of checking an error like this on the old system, but they just fell flat down," Boston said. The county and state agencies handling the case both discovered the error at the same time, he added.

With the new system, the erroneous entry would have been blocked by the computer. The woman's name had already been taken off the public assistance system, so a cross-check could have been done, Boston said.

The new system has a data base structure and "a lot more edits built in to prevent errors," he added.

"There were relatively few errors with the old system [compared with] the amount we expected to find," Boston said. Most of the errors involved locating a case in the wrong county rather than a wrong payment.

Only the $13,489 error "was large enough to make the papers," he said, noting the nursing home has repaid the money to the state.

Ohio pays approximately $13 million to $14 million monthly to 850 nursing homes caring for 30,000 recipients..

State's Backlog Hits $20 Million

(Continued from Page 1)

state's optical scanner, the form will also not fit into a standard typewriter, so many pharmacists have to pay someone $100 per month to prepare the forms for them, Lane said.

In addition, providers have complained about the additional information required on the form. The form requests that the provider now include a patient's last name as well as Medicaid number, which results in a lot of rejections because the patient's name is often misspelled on a prescription, Lane said.

"No one has ever given us a reason for doing this. If we had a good reason, we wouldn't mind," he added.

The MMIS also requires that every doctor be assigned a unique Medicaid number, although Lane said providers already use the physician's license number. Using another number would leave even more room for error and create a lot of extra work, he said.

"The problem is that the people who make the policies don't have to work with them out in the field," Lane said.

While pharmacists have never been paid on time, even with the old system, the new system is even worse, he added. "Medicaid has been a failure from the start in 1967 because of poor management, bad directors, problematic people and lack of attention.

"It's a bureaucracy, and that's the problem. A private computer firm could have done the job much better than the state is doing," he said.

Thurmond is more positive about the new system and claimed that criticism of the system "unjust. The old system just couldn't handle the workload. We were rapidly sinking," he said.

Although Medicaid has been accused of implementing the system too soon, "there is no 'too soon' in Medicaid. If anything, it's eight years too late," Thurmond said. "I would have tried to implement it even sooner."

But "there is always the possibility of a system being implemented too soon," Bob Allen, DAS' director of information and computer services, said. "From a services standpoint it probably wasn't implemented too soon, but probably from a DP standpoint the system could have stood a while."

Georgia's Gov. George Busbee, who was recently elected by the National Governor's Council to head a reform committee on Medicaid, "has taken a very strong stand" on correcting the problems with the new system, Thurmond said. Busbee authorized the temporary employment of 80 to 90 people to help process the claims until the backlog is eliminated, and Thurmond expects the claims to be paid up in 60 to 90 days.

A new form has also been designed and will be put into use in September, he noted. "If it's sent out the way I've seen it, it should work," Lane said.

As for the other aspects of the MMIS, "it is working the way it's supposed to," Allen said.

"For the first time we have surveillance of providers and recipients," Thurmond said, and the system "has given me the financial data on where we're spending dollars to help me make policy decisions."

Correction

In "Former OSI Employee Convicted of Stealing Proprietary Software" [CW, June 28], the acronym OSI was used to refer to Optimum Systems, Inc. of Rockville, Md.

Computerworld has since learned that OSI was registered with the U.S. Patent Office in 1973 as the service mark of On-Line Software, Inc. of Hackensack, N.J., and regrets any problems that may have been caused.

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Carriers Score Point in Battle To 'Humanize' Route Evaluation

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. – The National Association of Letter Carriers (Nalc) has won what it claims is an important victory in its fight to humanize or eliminate the computerized Letter Carrier Route Evaluation System being tested by the U.S. Postal Service in two U.S. cities.

The Kokomo Plan is a computerized work measurement system and method of evaluating work to get every letter carrier route as close as possible to an eight-hour day [CW, Aug. 20; Nov. 5].

An interim award in favor of Nalc was handed down by Sylvester Garrett, an impartial labor dispute arbitrator, in response to the union's challenge of 38 carriers in Portland, Ore., having to put in excessive overtime as a result of routes mapped out by the computer system.

Garrett's decision leading to the interim award is a signal Nalc will win its battle in demonstrating the impracticality of the present system, according to Nalc President James H. Rademacher.

The Kokomo Plan is based on a technique borrowed from the private industry sector called methods-time measurement (MTM) studies, which does not take individual human stamina into account to designate letter carrier routes, Rademacher said.

Garrett went to Portland to hear testimony from letter carriers from Rose City Station who said they were forced to put in nine- and 10-hour days, six days a week, to complete their weekly tasks of delivering the mail there. He also heard carriers' wives testify the overtime spent was breaking up family life, Rademacher said.

"Garrett saw people who were victims of the computerized adjustments" to their routes and made the obvious decision, he said.

Lacks Human Elements

The Kokomo Plan is not a fair assessment of routing, Rademacher said, because the MTM plan does not include ingredients of human elements – human differences of physical endurance.

The route laid out by the computer may require too much from a female carrier or a carrier near retirement age, he said.

In addition, the computer has seemingly not taken into consideration a 10% increase in letter volume in Portland since the time the plan went into effect.

According to an article in *The Wall Street Journal*, the top labor relations official of the Postal Service, James Conway, said he was not "at all happy" with the overtime ruling. "I don't think the evidence justified the arbitrator's conclusion," he added.

The *Journal* also said Conway was confident Nalc's challenge to the plan will be denied in the end.

The Postal Service will file a final brief by July 23 in reaction to Garrett's decision, and a final decision should be handed down within six weeks.

If the Kokomo Plan was to be implemented in accordance with the strict formula set forth by the Postal Service, about 15,000 letter carriers would be eliminated, Rademacher said.

The Postal Service can't lay the carriers off; people would have to be integrated into different areas in the future as a result of attrition, etc., he said.

A Postal Service spokesman would not comment further on the matter because "the case is still in arbitration."

Grants Data Base Bill Gets Nod From Senate

WASHINGTON, D.C. – The Senate has approved a bill that would create a data bank of all federal domestic grants.

The bill, S. 3281, introduced by senators Edward M. Kennedy (D-Mass.) and William V. Roth Jr. (R-Del.), calls for a computerized system that would also track the status of funds for each program and help local communities determine the programs for which they are eligible [CW, May 24].

The legislation has been passed on to the House Government Operations Committee's Subcommittee on Legislation and National Security, which is already considering an identical bill H.R. 13186 introduced in the House by Rep. Charles Rose (D-N.C.).

No further action on the bills is expected until after the Republican National Convention.

SSA Awards Controversial Bid

BALTIMORE – Despite opposition from many congressional leaders, the Social Security Administration (SSA) will get expanded computer facilities here.

A $37.5 million construction contract was awarded to a three-firm consortium of U.S. Steel Corp.'s American Bridge Division, Owens-Corning Fiberglas Corp. and Wolff & Munier, Inc.

The contract award was delayed last month after a report by the General Accounting Office said the agency did not need new computer facilities [CW, June 21].

However, construction of the buildings and the efficiency of SSA's computer operations were actually two separate issues, a Capitol Hill spokesman said.

The contract, which was let by the General Services Administration (GSA), calls only for the "building systems" portion of the two SSA complexes, a GSA spokesman explained.

Building systems provided for in the contract include structural framework; heating-ventilation-air conditioning distribution; electrical distribution; finished floors; ceilings; lights; and partitions.

The building systems approach taken by the winning contractor has been used in the construction of two other government buildings and has been found cost-effective, the GSA spokesman said. The approach is expected to save the government about $6.5 million, he added.

The five-story aluminum-skinned computer center will be on a 34-acre site and will provide 697,000 square feet of space.

Inside, 320,500 square feet will be provided for computer hardware and support personnel.

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Communications No Small Job In Preparation for Convention

By Nancy French
Of the CW Staff

NEW YORK – Last week's Democratic National Convention here was a gigantic communications job for the New York Telephone Co., with service reliability a critical factor.

In addition to installing about 5,000 telephones, 250 temporary pay telephones and 1,200 special service circuits for such things as teletypewriters and data transmission, Bell employees installed 77 video lines to carry TV signals from cameras in and around Madison Square Garden to the three national TV networks' central transmission points many blocks away where long lines sent pictures and sound to affiliates throughout the country.

To assure repairs could be made quickly if telephone equipment or lines malfunctioned, a computerized testing facility known as the Switched Access Remote Test System (Sarts) was installed, according to a spokeswoman from Western Electric, manufacturer of the system.

Sarts enabled one technician at a computer terminal test point a block from Madison Square Garden to identify the source of line difficulties in about seven minutes compared to the 40-minute test time normally needed for manual diagnosis, she said.

Nineteen Operators on Watch

Trouble calls reported to the telephone company were directed to one of 19 console operators seated at Bell Dataspeed 40 CRTs equipped with Western Electric telephone consoles.

To locate a problem, operators accessed a Digital Equipment Corp. PDP-11/40 in Brooklyn which activated a series of tests.

All special services lines for the convention were wired directly into Sarts for full coverage. Sarts was also used in line maintenance – to test noise, signal and voltage levels as well as performing about 200 other commands, the spokeswoman said.

When the area of trouble was located, the console operator was notified on his CRT screen so repair crews could be dispatched.

Even before the Ringling Brothers and Barnum & Bailey Circus had moved its elephants out of center ring at Madison Square Garden, New York Telephone crews were at work there installing miles of cable and tons of switching equipment in preparation for last week's Democratic National Convention.

CBS Had Data Base Ready for Nomination Fight

(Continued from Page 1)

The delegate profiles were digitized and stored in the data base, with access programs written in APL, he said.

Information was accessed through portable typewriter terminals set up adjacent to the convention floor and in CBS offices in Penn Plaza, he said. Communications to the 370/155 were handled through dial-up phone lines.

The system provided the "capability of producing a real-time tabulation of the file and tabulation of different types of delegate characteristics," he said.

Further, "an inquiry system was written to enable correspondents to find delegates that had specific characteristics," he said. Correspondents and their producers merely asked for information they needed and computer printouts were brought right to the floor.

The information was also used to print out briefing handbooks about all the delegates, he explained.

As for the vote-tabulating system, CBS managed this responsibility for all three networks, Mitofsky said. Using a CRT terminal, CBS news personnel keyed voting results as they were registered into the 370/155 via a leased telephone line.

After tabulation by the 370, the data was output through a minicomputer to update a Vidifont character generator.

"What was distributed to the three networks was a videopicture of numbers which could be superimposed over the video pictures the networks were producing themselves," Mitofsky explained.

Neither NBC nor ABC received any other access to the system, he added.

Same Way of Voting

Meanwhile, on the floor, delegates voted the same way they always have, Mitofsky said. Going to an electronic voting system "would have cost too much and besides, it would ruin all the drama," he remarked.

While the delegate survey system was provided at the Miami convention four years ago, the tabulating system was used last week for the first time, replacing a manual system of adding machines and mechanical digits.

One feature of the CBS system which Mitofsky believes is unique is that all programming needed to update the character generator was written on the 155 in APL rather than on the minicomputer actually used to run it.

This saved programmers the time and drudgery of programming the mini in machine-level coding, he said. Mitofsky himself has no background in DP, learning what he knows about computers "from growing up in the news business."

CBS did not move its 370/155 to Madison Square Garden, where the convention was held, according to Mitofsky. It was an accident of fate that the convention was held in the same location as the CBS computer, he said.

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The Employee Retirement Income Security Act of 1974 effective January 1, 1976 mandates the recording of all hours worked and not worked, compensated and non-compensated, as well as all dollars affecting employee pension benefits.

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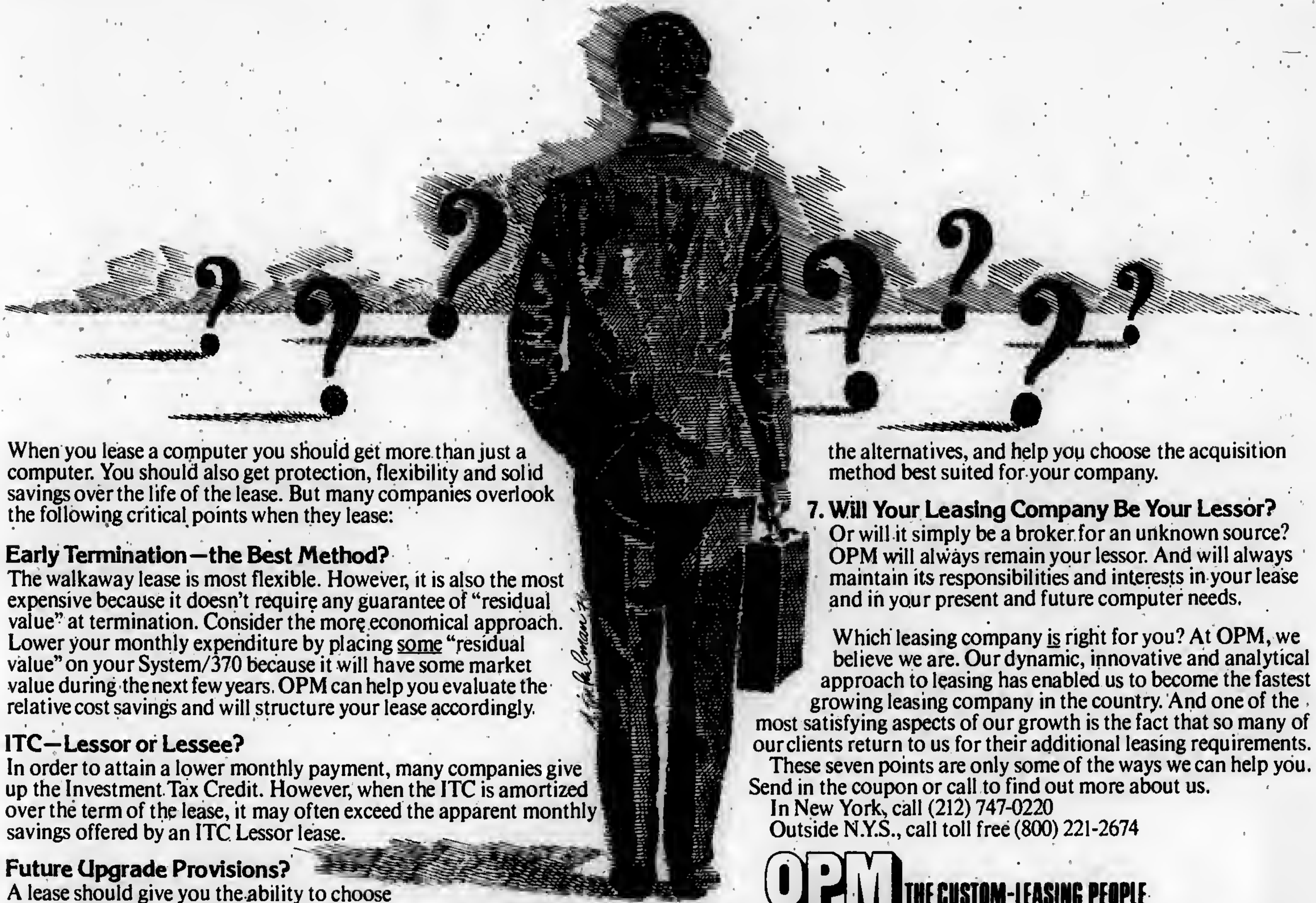
S/370 Computer Leasing: 7 Ways to Avoid Costly Mistakes



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1. Early Termination—the Best Method?
The walkaway lease is most flexible. However, it is also the most expensive because it doesn't require any guarantee of "residual value" at termination. Consider the more economical approach. Lower your monthly expenditure by placing some "residual value" on your System/370 because it will have some market value during the next few years. OPM can help you evaluate the relative cost savings and will structure your lease accordingly.

2. ITC—Lessor or Lessee?
In order to attain a lower monthly payment, many companies give up the Investment Tax Credit. However, when the ITC is amortized over the term of the lease, it may often exceed the apparent monthly savings offered by an ITC Lessor lease.

3. Future Upgrade Provisions?
A lease should give you the ability to choose the simplest and most economical way of adding on memory, features or other changes. Your OPM lease will specify the future cost of such upgrades. But it will also allow you to select other methods of acquisition.

4. New Or Used Equipment?
Should you consider used equipment for all or part of your system requirements? OPM will explore with you the merits of leasing or subleasing used equipment.

5. Sublease and Assignment Provisions?
At some point you may want to sublease or assign your system to another user. OPM allows you to do so at any time during your lease term. And will even assist you in finding a suitable sublessee or assignee.

6. "Present Value"—The Great Equalizer.
Typically, you'll be faced with many alternative methods of acquisition. OPM will develop for you a "present value" analysis that will take into account all possible variables. This analysis will show the true cost of the alternatives, and help you choose the acquisition method best suited for your company.

7. Will Your Leasing Company Be Your Lessor?
Or will it simply be a broker for an unknown source? OPM will always remain your lessor. And will always maintain its responsibilities and interests in your lease and in your present and future computer needs.

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CW

Burroughs Doubles Power of B6700s in 800 Releases

(Continued from Page 1)

by the configuration, a spokesman noted.

Global memory enables multiple processors to operate in either a multiprocessor mode or in a shared-resources mode.

In the multiprocessor mode, the Master Control Program (MCP) manages the system's resources as a whole; jobs have the ability to migrate from Global or one main memory to another depending on the workload, a spokesman explained.

In the shared-resources mode, the systems work independently, each processing its own job stream, but with access to a shared data base. Users who wish to dedicate one of the processors to interactive processing while running batch on the other, without splitting the data base, can now do so, Burroughs noted.

A device to allow B6700 users to add B6800 processors to their configurations and run the systems side by side as a common system was also introduced, a spokesman noted.

A mini-disk subsystem introduced for the B80 small business system [CW, May 3] using industry-compatible flexible media can be used with the B6800 for I/O with cards, he said.

The B6807 and B6811 systems each can have one I/O processor and the B7821 can have two. Each I/O processor, operating independently on the CPU, has 20 channels, 12 with 512-byte buffers and eight with 256-byte buffers, compared with the earlier I/O processor which only had 6-byte buffers, the spokesman noted. Data is transferred at an aggregate rate of 2.2M byte/sec, Burroughs said.

A data communications subsystem introduced with the enhanced B7700 models [CW, April 19] can be used with the B6800. Each subsystem contains 384K bytes of memory and allows network continuation and recovery if the CPU is not available, the firm said.

A broadband communications control and a control to provide for high-speed block transfer of messages, also introduced with the B7700 enhancements, is available for the B6800.

B6800 Maintenance

Maintenance for the B6800 system is performed through a special microprocessor-based maintenance processor which uses regular system peripherals to run diagnostic routines and can access and display the CPU's status, Burroughs said.

Diagnostic software is driven by the MCP and runs on-line. Self-test logic allows the CPU to test itself during periods of idle operation, the firm noted.

To improve the system's accuracy, the CPU retries instructions, retains addresses and performs residue checks of all address calculations, Burroughs said.

The B6800 can accommodate Cobol, Algol, Fortran, PL/1, Basic and APL, languages available on the B6700. Programs enabling conversions from other manufacturers' equipment are available.

The size of the B6800 systems has been reduced by 40% over the B6700, the spokesman noted.

Prices range from $778,000 for a B6807 with 786K bytes of memory, card reader, card punch, printer, three magnetic tape units and 350M bytes of disk to $4,019,800 for a B6821 dual-processor system with 3M bytes of main memory; 786K bytes of Global memory; two card readers; four printers; 16 tapes; a 2G-byte disk subsystem; two data communications processors, each with 393K bytes of local memory; and line termination equipment.

The B6811 will be available next January, the B6807 in August of 1977 and the B6821 in January of 1978, the firm said. Burroughs is located in Detroit, Mich. 48232.

Exchange Under Way For Federal Software

(Continued from Page 1)

Once gathered, this information is to be maintained in a catalog, published and updated quarterly by the National Technical Information Service.

Agencies will be required to search through the listings of what is available from FSEC before they are allowed to acquire any software from outside sources, according to Chris Bythewood; who has organized the operation at GSA.

Software covered by the exchange is limited to programs written by agency staffs or by outside contractors working for agencies. Explicitly excluded are programs that are classified, proprietary or "developed with revolving funds" or software "to which the government does not possess the full rights of ownership," in the language of the FPMR.

Though developed with federal funding, programs in the FSEC will be considered "property" and therefore not in the public domain. Only federal agencies will have access to them, Bythewood said, noting however that the status of the software is currently under legal review.

Government "property" cannot be given away (to a nongovernment user, for example) without specific authorization, he explained. On the other hand, an agency "giving away" a copy of a software routine still has the routine for its own use "and hasn't lost any real property at all – which makes a very awkward situation, logically and legally," he said.

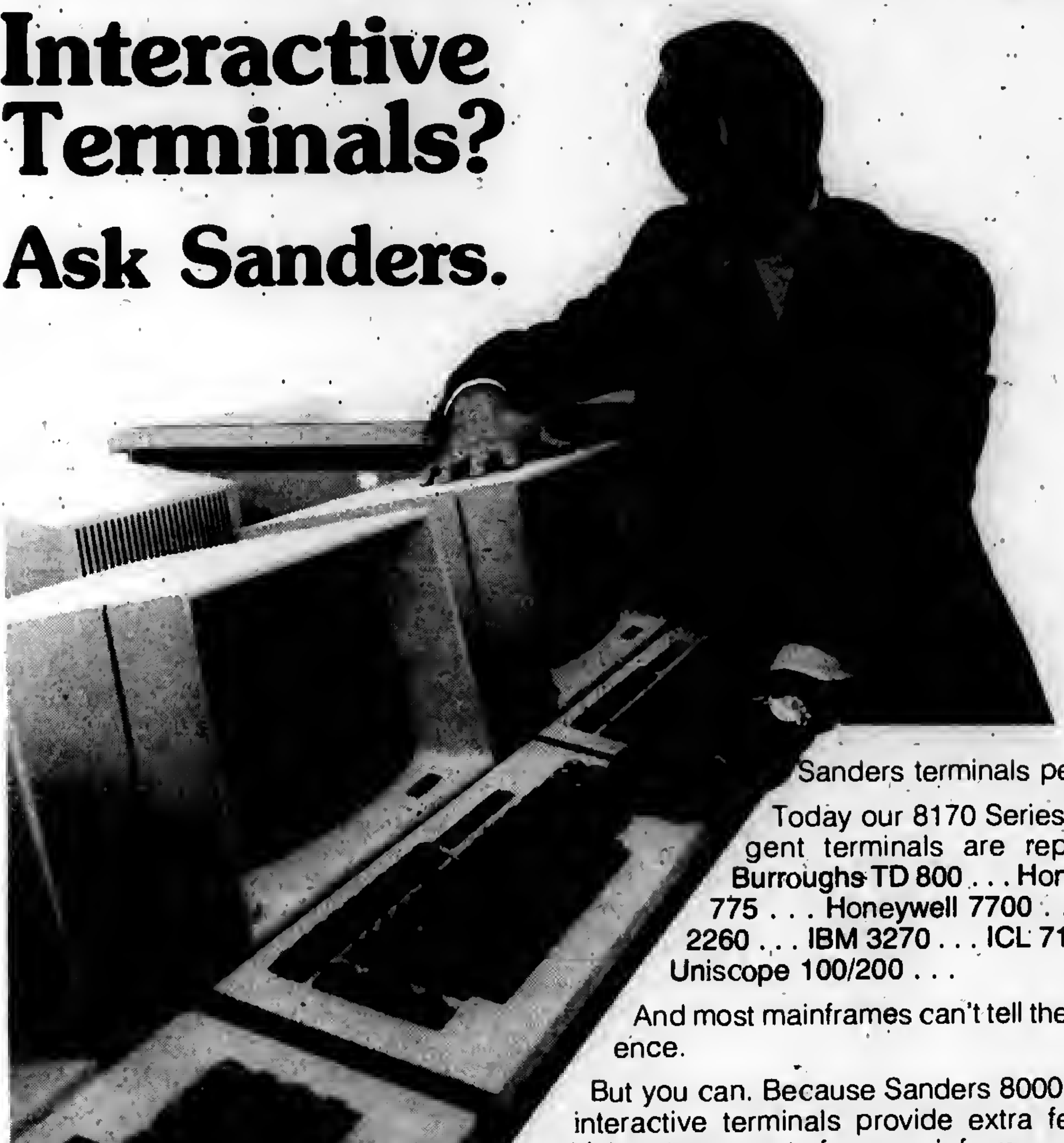
While one part of the FPMR defines what agencies must do to support the creation and maintenance of the FSEC library, another paragraph outlines the expected benefits from use of the exchange and another states what can happen if agencies try to bypass using the center altogether.

Agencies must, for example, submit abstracts of programs meeting the criteria in the FPMR's definition of "common use software" and later notify the center of changes in any software previously reported.

Once an abstract has been furnished, an agency must be willing to submit a copy of the program and its documentation – very specifically defined in the FPMR – within 15 days of a request from FSEC. This is a one-time submission, the regulation noted.

Another sentence calls on agencies to notify FSEC when they no longer maintain previously reported software.

Any agency seeking software from outside sources must certify in writing it has screened FSEC unsuccessfully on a specific date; without such a certifying statement, the regulation warned, the GSA will not issue a delegation of authority to make the requested purchase.



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*T.M. Sanders Associates, Inc.

Court Today Hearing IBM Bid To Overturn Document Decision

(Continued from Page 1)

stated in its June 1 petition to the appellate court.

Today's arguments mark the second time IBM has brought suit against Edelstein in the Second Circuit and the fourth time the firm has locked horns with the Justice Department in the higher court.

The government has often protested that a review of one aspect of the case by the appellate court before the trial in the district court is complete is unusual and further complicated by the complexity and length of U.S. vs. IBM.

Justice Department attorneys believe IBM should wait until Edelstein has made his final decision and then appeal the whole case if the decision isn't in the firm's favor.

But IBM maintains Edelstein's orders "are systematically stripping the defendant of virtually all protection of the attorney-client privilege and much of the protection of the work product rule both in this case and in several other federal courts since the same facts and issues involved [in the district court] have been and are being litigated in other circuits."

If the matter is not reviewed by the appellate court now, "the defense will be so prejudiced that the only course open to this court will be not only ultimate reversal of any final judgment entered against IBM, but dismissal with prejudice as well," the corporation's petition said.

The issue of the protection IBM documents should receive, however, has been reviewed by higher courts before – including the U.S. Supreme Court – and by several judges specifically appointed by Edelstein to review all questions of privilege. IBM has lost the majority of those scuffles.

Accusing Edelstein of making a "shambles" of the law governing the attorney-client privilege, IBM has told the three-judge panel of the appeals court his decision means "neither a lawyer's advice nor a client's communication given in appropriate confidential circumstances is privileged unless, and only unless, that advice and communication recite 'confidential information' from the client."

In their brief and orally today, however, IBM attorneys will argue that with few exceptions the rule has always been "that all communications between attorney and client made in confidence for the purpose of obtaining or giving legal advice are privileged."

Edelstein made his order without personally studying the contents of any of these documents, the corporation's lawyers have also stated.

Arguing on the judge's behalf in a July 12 response, government attorneys have asked the circuit court to reject IBM's petition because "the documents ordered to be produced are not the traditional 'law shop' documents prepared exclusively by and for attorneys, but IBM corporate documents" found to be non-privileged and without work product immunity after three years of careful review.

IBM's fears that the documents will enter the public record or be used in other trials against the firm can be allayed through a petition to Edelstein to protect them after they have been turned over to the U.S., Justice Department attorneys maintained.

Charging the corporation has withheld the documents for five years with claims of privilege and work product, the government said in its brief IBM is legally incorrect in asking for an extraordinary writ of mandamus to seek an interlocutory review of Edelstein's order requiring the documents to be produced.

If received, the mandamus and review by the second circuit would have the effect of reversing the district court judge's order.

The arguments this afternoon will be heard by Circuit Court Judges Hays, Van Graafeiland and Meskill. Edelstein will most certainly not adjourn the regular session of U.S. vs. IBM in the district court to hear the appellate arguments, a member of his staff said.

The arguments were originally scheduled to be heard on June 11, but were postponed at the government's request.

Thomas D. Barr, lead IBM attorney, will argue the matter before the circuit judges for his client and B. Barry Grossman, chief of the appellate section of the Justice Department's Antitrust Division, will handle the government's claims.

IBM Half-Year Net Gains 25%

ARMONK, N.Y. – Adding still another quarter with "a higher than forecasted volume of outright purchases," IBM showed earnings increases in the second quarter and six months of 26.5% and 25.5% respectively compared with year-ago figures.

Revenue gains were 14.8% in the quarter and 15.7% in the half.

For the six months, IBM earned $1.137 billion or $7.57 a share compared with nearly $906 million or $6.09 a share in the same period last year.

In the half, outright sales rose nearly 43% to $2.744 billion while other income increased almost 27% to $224.3 million.

Gross revenues rose 15.7% in the half-year to $7.828 billion compared with $6.768 billion in the same period last year.

During the quarter, earnings reached nearly $593 million or $3.94 a share compared with almost $469 million or $3.14 a share in the year-ago period.

Gross revenues rose 14.8% to nearly $4.014 billion compared with $3.496 billion in last year's second quarter.

This includes sales of $1.457 billion, up 42% over the year-ago $1.025 billion.

During the quarter, IBM's "other income," mostly interest, rose almost 38% to $117.3 million compared with $85.1 million in the same period last year.

"Operating results for the second quarter and for the six months continued at a very satisfactory level," IBM Chairman Frank T. Cary said.

The second quarter was characterized by a higher than forecasted volume of outright purchases of data processing equipment with volumes substantially greater than the comparable period of last year.

"As previously pointed out to stockholders, outright purchases result in the immediate realization of income while income from rental transactions is realized over a period of years," he observed.

"Gross income from rentals and services increased 4.9% over the comparable 1975 period. This relatively low rate of increase results from the high level of equipment purchased in recent periods," Cary said.

Rental and service income for the half totaled $5.084 billion.

"Incoming orders for DP equipment are continuing at a strong pace," Cary added.

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Seven-Point Scale Proposed

Sensitivity Urged as Personal Data Rating

By Nancy French

Of the CW Staff

NEW YORK – Personal information should be classified by sensitivity level before it is stored in expensive computerized information systems because it is unnecessarily costly to protect a person's phone number with the same zeal as his psychiatric history.

Toward that end, the Rand Corp.'s Rein Turn proposed a seven-point sensitivity scale for personal information.

Personal information becomes sensitive when its uncontrolled dissemination may have adverse effects on the data subject or when it shows the individual does not possess the values of his acquaintances or those making determinations affecting him or society, Turn told a recent conference here.

Such information may include an individual's past transgressions, views or associations; results of medical or psychiatric examinations; or information on an ongoing criminal investigation of the individual, he explained.

The Privacy Act of 1974 as well as a number of state laws require information collectors to assure individuals are not harmed, embarrassed or inconvenienced as a result of the use or misuse of such personal information, he said.

The adverse affects of revealing personal information on an individual to others or to the individual himself may range from mild annoyance, such as junk mail, to loss of life, such as occurred in Greece when it became known that a U.S. Embassy employee was an agent of the Central Intelligence Agency.

Who Sees Data?

However, a consideration in setting up a classification system is identifying the recipients of personal information, Turn said. These can include:

- The data subject or those representing his interests, such as his family, guardian, physician, lawyer or accountant.
- Personnel of the recordkeeping organization, including those who have a specific need to use the information and those who do not.
- Organizations with subpoena power, such as courts, grand juries and investigative committees at various levels of government.
- Any member of the general public who is interested in seeing the information.

To satisfy both the individual and the organization that needs the information, Turn suggested a seven-point sensitivity scale.

Category 1 would be limited to information that is public by statute, such as a property tax roster, he said.

Individuals would know of its existence and also have access to it. Authorized users and others in the agency that maintains it also could access it. The information would be subject to subpoena and open to the general public, Turn proposed.

Category 2 data would include information that is considered public but not by statute, such as employee telephone directories. This information would be available to the same individuals as Category 1 data, he said.

Category 3 data would be limited official data, such as personnel records. Turn said the data subject would know about these records as well as having access to them.

The agency that maintains the Category 3 data would permit users as well as others in the organization to access such data, and it would also be subject to subpoena. However, this information would not be open to the general public, he said.

Category 4 information, including such files as payroll records, would be considered restricted. While the individual would know about these records and have access to them, users would be somewhat restricted.

Specific authorized users would be defined and others would not have access to them, Turn said, adding the data would be subject to subpoena, but would not be accessible to the public.

Category 5 information would include data that is confidential by statute, such as social research data.

Its existence would be common knowledge to the individual to whom it pertained as well as accessible to him. It would also be accessible to authorized users within the collecting organization, but would be closed to all others within the collecting organization. It would not be subject to subpoena nor available to the public, he proposed.

Category 6 information would include those files ruled sensitive by statute and include such data as psychiatric examination records and some level 4 and 5 information, he said.

The individual would know of the records' existence, but would not have access to it, Turn explained. Within the user organization, only authorized users would have access.

No subpoena could force the collecting agency to produce Category 6 data, and it would be closed to the public.

Into Category 7 Turn placed data that is secret by statute and includes information such as crime investigatory records. No one would have access to it except for authorized users in the collecting organization, he said.

Suggesting three security classifications for the data categories outlined, Turn said information in categories 1, 2 and 3 would be protected sufficiently with basic memory protect devices that would shield it from physical harm.

Information in categories 4 and 5 would require marking of hard copy and accountability requirements such as audit logs and access control in addition to simple physical security, he suggested.

Categories 6 and 7 would require dedicated systems, encryption, full accountability and, in some cases, off-line storage, he said.

NCIC Warns Some '76 Ford Trucks May Have Same VIN as '67 Models

WASHINGTON, D.C. – The Ford Motor Corp. is using the same vehicle identification numbers (VIN) for its 1976 trucks that it used in 1967, making law enforcement still more complicated for the police officer on the beat.

According to a recent newsletter published by the National Crime Information Center (NCIC), the organization that maintains computerized records of stolen property, this duplication could result in a 1967 truck and a 1976 truck with the same engine and body type being on the highway at the same time.

Although a Ford spokesman said the likelihood of a repeat number is very small because a 1976 pickup would have to be built at the same plant to the same specifications to be assigned the same number as a 1967 model, both Indiana and Oregon discovered the problem and reported it to the NCIC, the newsletter said.

The Ford spokesman emphasized the duplicate numbers "do not violate the law . . . but steps are being taken to restructure the VIN system to avoid duplications in the future."

NCIC users have been alerted to this "potential problem" when making operational inquiries on a vehicle and when entering vehicle records, felony vehicle records and license plate numbers.

An auto is numbered in four different places, according to the Ford spokesman: on an addressograph plate near the driver's door, as a stamped impression on the frame and in two hidden locations.

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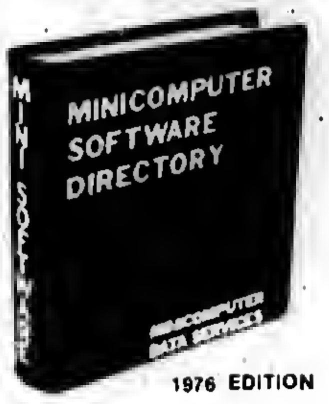

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HEW-Ordered Quality Control Program Helping States Reduce Welfare Errors

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – "Historically, the only thing a computer system has been used for in a welfare agency is issuing checks."

The Department of Health, Education and Welfare (HEW) has required states to change that tradition, however, by instituting quality control (QC) programs to reduce the number of and causes for ineligible and incorrectly paid welfare recipients.

QC is a management tool used in industry for evaluating and controlling the quality of products or services. The goal of HEW's computerized QC program is to lower each state's rate of ineligible cases to 3% and rate of overpayment to 5%.

As of June 30, 1975, nine states had met the goal for ineligibility and two for overpayments. Approximately $980 million has been saved nationwide since QC started, according to Dr. Victor Kugajevsky, director of the HEW department that oversees the QC program.

"This is the first time the welfare program has been made accountable," Kugajevsky said. Because of this, the drive to institute the QC system ran into roadblocks of both a systems and human nature.

Regulations requiring a QC program were issued by HEW in 1964, but states were slow to implement the program. In 1973, the agency issued new regulations which called for withholding federal funds if errors crested the prescribed tolerance levels.

The threat of withholding funds worked; today, all states have QC programs in their welfare systems.

The QC program operates by examining a sample of cases each month for determination of eligibility and payment status. "This process consists of ordering, handling and processing the data collected in the review process. It includes preparation of monthly status reports and maintenance of process control charts," Kugajevsky explained.

Prototype System

HEW made available to the states a prototype of an automated system which was developed by several consultants working with advisory boards representing the states, he said.

The system has three purposes; to permit welfare payments, to measure data against other social security systems within a state and to analyze any errors made.

Three problems occurred most commonly when states implemented the system, Kugajevsky said.

"A lot of states have central DP units which do all the processing for the state. To correct errors you must have a quick turnaround, and often this is a low priority at a state's data center," he said.

Secondly, states that already had automated welfare systems had problems interfacing with HEW's QC system.

The third problem was that "the welfare staff was not trained in the use of the system" and so resisted using it, he said.

The reaction of welfare employees to QC was "by no means an open-hearted embrace," Kugajevsky recalled. The manager of one welfare program, however, welcomed the system "because it was the first time he knew what was going on."

Because a QC system must interface with another information systems and exchange information, privacy was a major concern.

"There is always concern about protecting the confidentiality of welfare recipients; because they are receiving public funds, they are under closer scrutiny. It's inevitable.

"However," Kugajevsky noted, "checks cannot be made on a recipient's employment and finance records without his permission."

Once data is obtained on the sample cases selected for QC, it is analyzed to determine whether errors were reduced to meet the goals and which error rates are increasing and which are decreasing, to identify clusters of errors which can be addressed specifically by corrective action, to identify causes of errors and to prepare summaries and explanations of QC findings for dissemination and use in planning and evaluating corrective action.

Flat Rate Advocated

There is still criticism of the QC program and its purported effectiveness in reducing errors. "The most unreasonable thing about QC is the use of industry standards of measuring products for measuring human services," according to Horace F. Jackson, deputy commissioner of the Bureau of Fiscal Operations for South Carolina.

Jackson feels the 3% and 5% error rates are arbitrary even though they may sound reasonable. He also believes the QC method is too simplified: "There was a lot of arm-twisting done to get a simplified method sold to the public."

A more effective method of reducing welfare errors than implementing a QC system would be to use flat grants, Jackson suggested. With a flat grant, every family unit on welfare would be paid the same amount for rent, transportation, etc., regardless of its actual expenses.

In South Carolina an ineligibility rate of 10% in 1973 is now 3.8% because of flat grants, Jackson said.

All states that use the flat grant method have reduced errors approximately 7% more than states without such a system, Kugajevsky said.

"The only area where flat grants help is in computational errors," he explained, noting the biggest cost in errors is in fraud rather than computational errors.

DP Chess Play-Offs Set for Amsterdam

AMSTERDAM – Spectators are welcome to the play-offs of the sports event of the computer world – the European computer chess championships.

Eight computer programs will match wits here on Aug. 9-11 as they contest for four places at the world championship tournament in Toronto next year.

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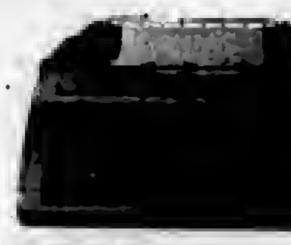
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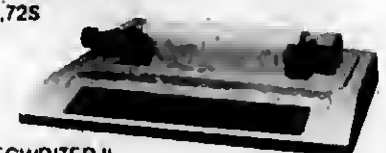
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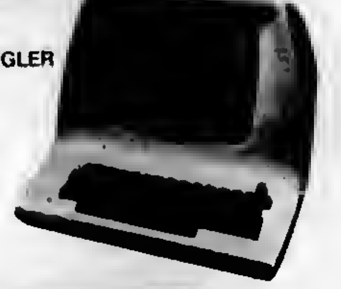
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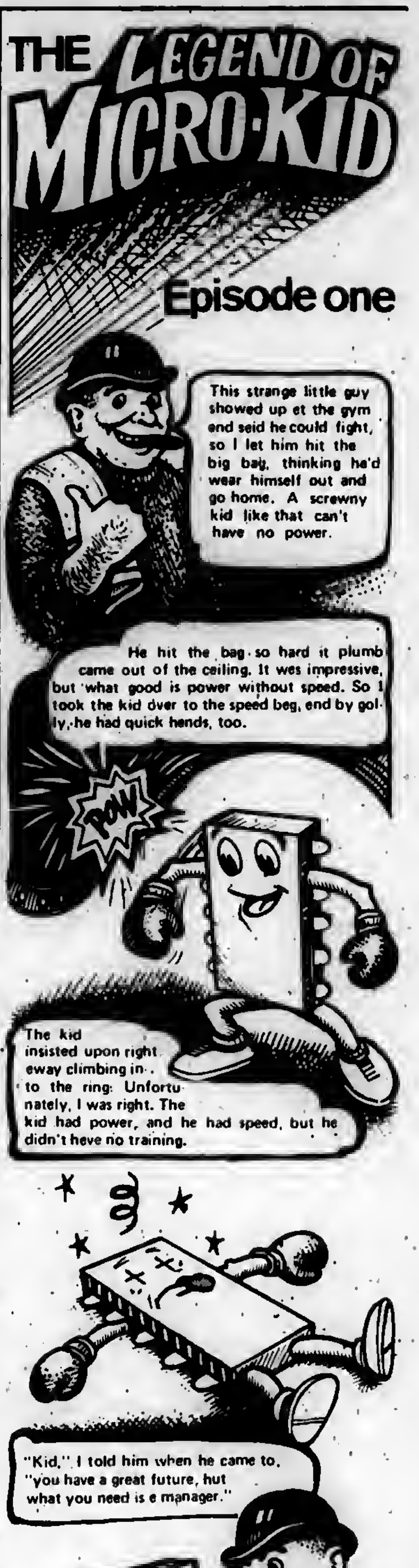
THE LEGEND OF MICRO-KID
Episode one
This strange little guy showed up at the gym and said he could fight, so I let him hit the big bag, thinking he'd wear himself out and go home. A screwny kid like that can't have no power.
He hit the bag so hard it plumb came out of the ceiling. It was impressive, but what good is power without speed. So I took the kid over to the speed bag, and by golly, he had quick hands, too.
POW
The kid insisted upon right away climbing in to the ring. Unfortunately, I was right. The kid had power, and he had speed, but he didn't have no training.
"Kid," I told him when he came to, "you have a great future, but what you need is a manager."

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Editorial

Many Things to Many People

The announcement by IBM of its 370/138 and 148 [CW, July 5] is many things to many people. It is loaded with complexities and, some analyts expect, clues to IBM future systems (FS).

At any rate, it provides some excitement in what had promised to be a long, hot summer in anticipation of FS someday and, possibly sooner, more 370 look-alikes from other sources.

Possibly the announcement is a move designed by IBM to lead users into the virtual storage fold and/or a reaction against future IBM CPU look-alikes that offer price/performance advantages such as have been rumored in the 135 and 145 sizes.

The first thing one notices is the low purchase prices. Minis aren't the only type of computer coming down in price these days. Aided by use of Mosfet memory, prices of the 138 and 148 are nearly half those of the 135 and 145, respectively.

Compare: a 1M-byte 148 sells for $689,000 compared with a similar-sized 145's price tag of nearly $1.3 million. And the ratio is similar with the 138 and 135.

Two for the price of one? Although IBM hasn't announced multiprocessor versions of the new machines, they may be loosely coupled, the firm said.

But in the case of the 138 and 148, low purchase prices alone do not make an IBM announcement, which industry observers termed "very complex," both for what it said and failed to say.

Maintenance charges for the machines, and especially the 145-III, are higher. The charge is $304/mo more for a 512K-byte 138 than a similar 135, while maintenance for the 1M-byte 148 is $210/mo more than for the 145.

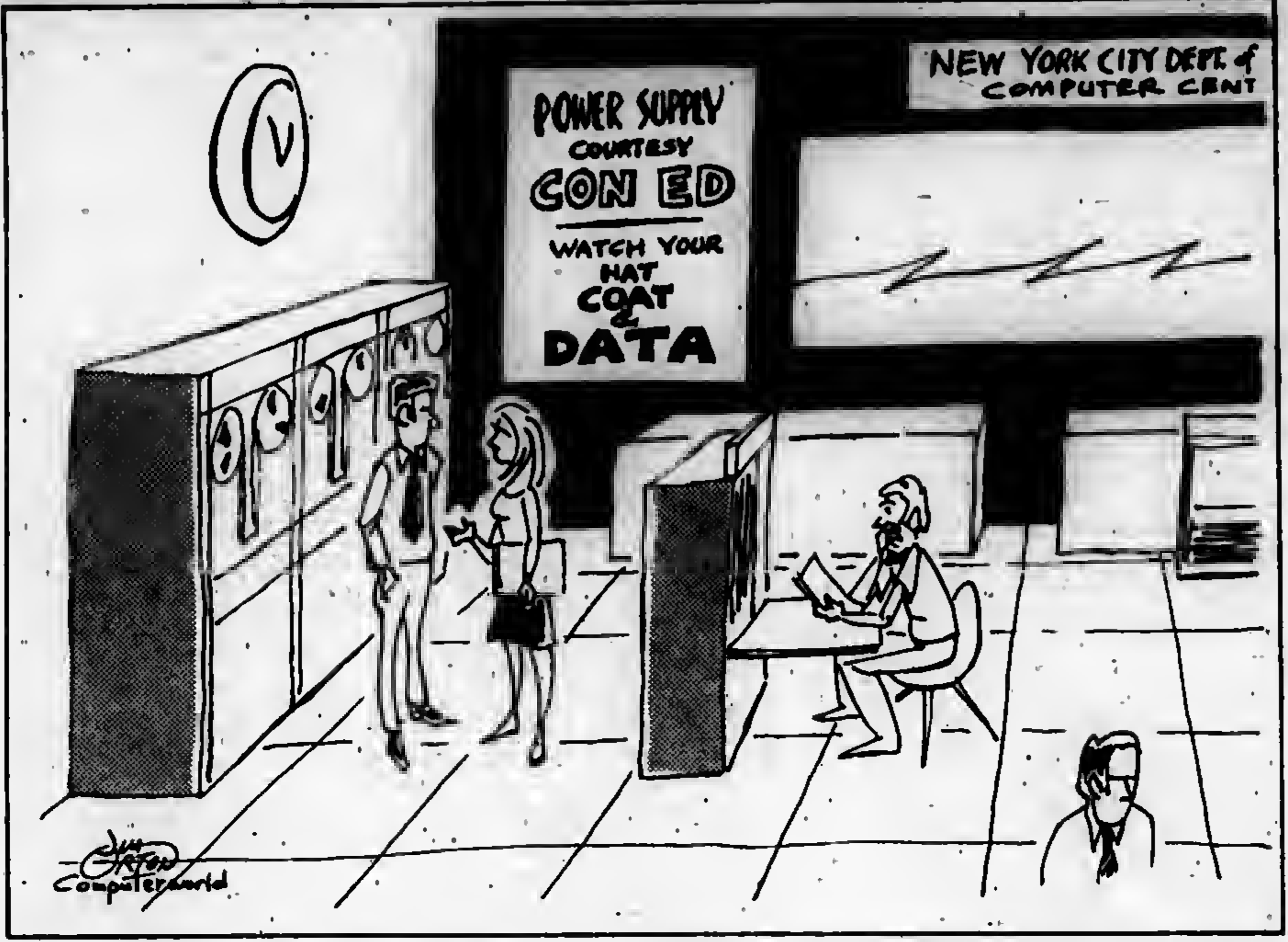
However, as if encouraging 145 users to proceed straight to the 148 rather than to the 145-III upgrade, maintenance on the -III with 2M bytes is $3,186/mo compared with $2,405/mo on the 148 and $2,960/mo on the 145.

Certainly there were signs something was going to emerge from Armonk. IBM is charging for its 512K bytes of memory the same price it announced when it cut prices on the memory [CW, May 24].

IBM also declared an end to OS/MFT and MVT support beginning in May 1977 [CW, July 5]. And the new models of the System 32 displayed lower lease/purchase ratios than other members in that family [CW, June 28].

The question has to be raised: If Amdahl Corp. and purportedly others could design and build machines with better price/performance ratios, using IBM software, why not IBM?

When it feels a push, the giant has proven it does not take long to respond. Perhaps users should thank the competition for their latest basket of goodies.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Letters to the Editor

ACM Should Forget Controversies; Concentrate on Strength in Unity

I have been reading with increasing dismay the highly personal comments concerning the recent Association for Computing Machinery (ACM) election in *Computerworld.*

It is very distressing that a highly respected and motivated person such as Jean Sammett should end her term by castigating so gracelessly her elected successor to the ACM presidency [CW, June 2]. I sincerely hope Herb Grosch will not feel compelled to continue his own comments and reply in kind.

Such statements are fratricidal and can only damage ACM and its worth to the membership. What is worse, these statements are irrelevant. The one central issue of the election was not individuals, but whether there was an orthodoxy of belief and action that should be maintained by the association.

A majority of the membership voted against orthodoxy. Their votes represented their belief that ACM is strengthened by the diversity of its members – and that the association is strongest and most productive when anyone who pays dues can vote and play a part in its work as long as he is a computer person.

Now is the time to forget personal controversies, likes and dislikes and, still retaining our diversity of opinion, come together to support and strengthen ACM as a truly professional society..

Gordon Smith

Greenwich, Conn.

Practical Solutions Needed

Alan Taylor's column, "Feedback to Mangement Marks Second Generation" [CW, June 21], would have us believe management is nothing but a bunch of dummies who are willing to accept any solution whatsoever to any problem. He also would have us believe the "first-generation" systems analyst looked for a result with the least computation for the simplest solution.

He somehow tried to tie these principles to a case in point – airline overbookings. Not only are these principles inaccurate and repulsive to systems analysts and management alike, but they do little to explain the overbooking problem.

Taylor is one who will go to the nth degree to explain to his readers some obscure check-digit procedure or poor case of forms design, but how about some constructive explanation and analysis of something interesting such as the overbooking problem?

Good communication and feedback between managers and analysts are important, but not sufficient to solve problems – intelligent and practical solutions are.

Edwin Levy

Philadelphia, Pa.

Could Grosch Be Sent Away?

For several years I have been reading Herb Grosch's egotistical jabbering in *Computerworld.* My only reason for doing this (after the first few issues) was hoping, based on odds alone, that sometime he might have something intelligent or informative (nonbiased) to say.

Alas, this has not been true.

Could someone send him to Russia, Germany, Japan – anywhere far off – on a one-way, expense-paid trip?

R.W. Minnis

Denton, Texas

Data Past

Five Years Ago
July 21, 1971

WASHINGTON, D.C. – An increase in federal financial aid led to increased collection and dissemination of intelligence data on potential troublemakers in many of the new police computer systems. The stress in such systems, which had received a portion of $6 million in block grants from the Law Enforcement Assistance Administration (LEAA), was on organized cime. But the systems were also suspected of containing information on people engaged in lawful, nonviolent protest.

– – –

WASHINGTON, D.C. – Federal agencics were found to spend nearly $3 million each year for software without any centralized direction or guidance in what they were doing, according to a report by the General Accounting Office (GAO). The result is often duplication of effort or puchase of programs already available elsewhere in the government, GAO said.

Eight Years Ago
July 17, 1968

WASHINGTON, D.C. – Six computer mainframe manufacturers accepted tough contract policies drawn up by the U.S. General Services Administration (GSA). The contracts were an attempt on the part of GSA to get better terms from equipment suppliers in the area of responsibility for performance specifications.

– – –

WASHINGTON, D.C. – The first two IBM 360/95s were accepted by the National Aeronautical and Space Administration's (Nasa) Goddard Space Flight Center. One of the 95s was to be used as the primary DP facility for the center's Tracking and Systems Directorate; the other was being used by astrophysicists to create mathematical models of the universe and to simulate evoluation of heavenly bodies.

Battles to Come

One of the best editorials to run in this paper in many months was in the issue (June 7) distributed at the National Computer Conference. In it, CW noted the poor user participation currently expected in the forthcoming battle, AT&T versus everybody, in Washington. The piece especially deplored the failure of professional organizations to act, or even to take sides, in matters vital to their membership. And it pointed to the tremendous resources, financial and massed-stockholder, which Ma Bell is throwing into combat.

Gray's *Elegy* had it pat:

> Let not ambition mock their useful toil,
> Their homely joys, and destiny obscure;
> Nor grandeur hear with a disdainful smile;
> The short and simple annals of the poor.

Although, in the coming fight, AT&T is more pugnacious than disdainful!

I'm deeply interested in whether, even in a few short months, something can be done to produce at least one major user submission, one major professional position, on data communications policy for the next decade. And it isn't just Bell: we all shudder in the cold wind of Armonk as the Gray Giant advances its plans for orbital empire.

The editorial noted the fears of ACM, DPMA and similar associations – notably, fear of losing their tax benefits. But that seems to me not too important a matter. The thing that hurt the Sierra Club, when IRS gave them the business, was the loss of tax-deductible donations, especially the larger ones. What ACM or DPMA, or AFIPS itself, would encounter if they made a substantial lobbying effort is not completely clear (ACM has a committee studying the matter), but probably mostly increased postage costs: one percent of budget, maybe.

There is legislation on the Hill at this moment proposing explicit limits, rather than the present "not . . . a substantial part," on lobbying expenditure by outfits like SHARE or ACM. Passage would help, but with elections coming, cannot be counted on. Moreover, the failure in the user world is a failure of nerve and of coordination, not primarily of money; a percentage of AFIPS budget far too small to attract the praying mantises of IRS would cover the printing and presentation of a useful if small ("short and simple annals of the poor"!) document if volunteers would prepare it and governing bodies OK it.

I believe it can be done, primarily by layers of insulation. Take the user group case – GUIDE, for example. An *ad hoc* committee of volunteers works up a pretty vigorous position and coordinates it with similar committees. It then, without attempting to get general membership approval, submits it to the Joint Users Group. That committee has been moribund for some years, but could be reactivated at the stroke of a pen – my pen, in this case! Meanwhile, ACM proper, DPMA, ASM and so on have their own small, activist groups at work, and also in coordination with the GUIDE/DECUS/HUG etc., etc. cells.

Again without attempting to get broad membership concurrence, the associations forward their positions to the AFIPS Washington office, which prints up a concensus pretty-like, picks a small cadre of testifiers for the inevitable hearings, and puts out a Heavy Press Release describing the submission as the "consensus of AFIPS member societies and affiliated organizations, comprising in all some 120,000 professional users of data communications facilities."

What would it take? Well, volunteers, for starters. If nobody has specific objections and positive recommendations, the machinery is useless. I assume the woods are full – hence, this column: to draw 'em out!

Next, a coordinator or coordinating group (very small). A re-energized JUG would do nicely, for a letterhead.

Money? I don't think so; not until the last level, AFIPS, anyhow – and then very little. Two or three thou for printing and travel, maybe.

Approvals! Well, the idea is to slide the papers upstairs quickly and quietly. That means officer or executive council action, not big-board votes or membership referenda. At the end, the AFIPS directors would almost certainly be involved, but many of them would have been active previously, within their own associations: if they had not approved then, nothing would have moved toward the final AFIPS level.

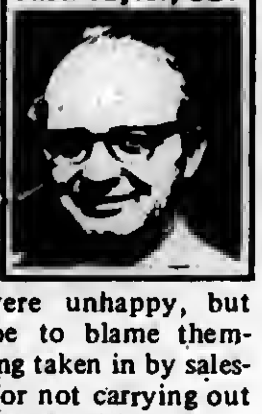
And of course, above all, awareness. If a few key people care, in each society, action is possible. If instead we have complacency, Pharisaism, or opposition upstairs, in even two or three of the major contributor groups, it won't fly. If the top men and women are aware, if they want to help, they can; mechanism can be generated.

AT&T cares. The other hardware mongers care. I'm positive that thousands of professionals care. The question is, how many? And how much?

Herb Grosch

AICPA DP Guidelines Have Room for Improvement

The Taylor Report
By Alan Taylor, CDP



The problem, as seen from the American Institute of Certified Public Accountants' (AICPA) headquarters, was simple. Accounting firms across the country were complaining about their computer systems. They simply didn't know what to do with them after they had been delivered.

There had been little or no planning apparently, or the plans had not come to fruition as expected. The accountants were unhappy, but seemed to be to blame themselves for being taken in by salesmanship or for not carrying out their own responsibilities.

The answer also seemed simple: Prepare a set of guidelines for the "little guy" who can't even afford to keep a single management advisory services man around, the man who, in the opinion of some studying the problem, really found it impossible to evaluate the available options.

So last year the Computer Applications Subcommittee, under H. David Smith, prepared "Guidelines for General System Specifications for a Computer System," available from AICPA at 1211 Ave. of the Americas, New York, N.Y. 10036.

The guidelines were approved this year by the Computer Services Executive Committee under Richard J. Guiltinan and have just been issued by AICPA.

Trouble started with the title. It was not restricted in any way. It seemed to cover any system. Certified public accountants (CPA) have many roles. Through the Management Advisory Services, AICPA members are encourated to sell "expertise" in computer areas. Unrestricted guidelines blessed by AICPA would be expected to encompass what was needed to provide this service expertly.

The elementary yes/no-type guides given don't begin to approach the necessary sophistication, but only a careful reading of the preface shows who the audience is assumed to be.

The guidelines, may, as is the hope apparently, permit different offerings to be put into some form of a priority order. A proposal that scores 15 "yeses" on documentation and three on workload expansion is presumably put higher on the priority list than a proposal that only gets 12 on documentation and one on workload expansion.

At least, that is the only way I can see the guideline scores being used by the novice to whom it is really addressed. And it might work if there were only a couple of categories.

But the guidelines are quite well categorized. There are checklists for:

- Documentation.
- Processing throughput.
- Data storage.
- Workload expansion capability.
- Programming language and operating software.
- Data controls.
- Security.
- System uptime.
- Vendor support.
- Physical facility requirements.
- Personnel requirements.
- Business relationship with the seller of the system.
- Cost justification.

Yes/no answers are suggested for all these categories. By the time one has counted the yes answers in each of the 13 categories, it is unlikely he will be able to see a nice, clear superiorty of any one system in all 13 areas. Then what does he do? The guidelines give no hint as to how to resolve that problem.

In any event, even the user has conquered this area, his problems have not been solved. Has everyone answered the questionnaire in the same way?

With ambiguous questions it is easy to misunderstand answers. For instance, one question read: "If the programs in the system impose any limits on the volume of application units processed, is it possible to modify these programs to increase the limits?"

The answer is to be given as simply yes or no.

Now, how is this going to help anyone? There aren't many cases where, if it were important, such a question couldn't be given a yes answer – even if the increase were a trivial one and only managed by hurting something else other than the volume, such as the throughput speed.

After all, if a user runs out of table space, he can always reduce the number of input/output buffers in use. That would do the trick, but nowhere is the user asked to explain how he would increase the limits.

Another example of a misleading question in the guidelines checklist read: "Does the system provide internal hardware and/or software functions to detect (a) input errors caused by improper input preparation?"

The question can't mean every error, can it? So it can be answered "yes" if any error is catchable. That's not much and can even make people think all catchable errors are caught, when it is not true.

How "Adequate"?

A third type of ambiguity can be seen in the security provisions. The question is: "Will the operation of the system involve adequate protection of data from improper disclosure or modification and from damage or loss?" Again, a yes/no answer is required.

But what is "adequate" protection? Does this mean there are some precautions against broadcasting the file contents? I don't know of any case where there aren't some precautions available. The point that needs evaluating is how good the precautions are. It simply is not a yes/no question.

Here lies the clue to what is wrong with this system. The guidelines offer a simplistic approach in an area which is simply unsuitable for such treatment. Data processing at any level requires more than such an approach.

An operation such as AICPA should not, by publishing this book, give the benefit of its general blessing upon such poorly defined, poorly qualified material.

That is not to say there is no room for some form of cookbook on system specifications that would be useful to virgin CPA accounts. It will have to be more carefully prepared and less dogmatic than the current publication, however.

Contract considerations have changed since 1969, for instance. Equipment analyses should show equipment, not vendors' names, and 1974 surveys (known to be seriously incomplete) should not be presented as probably showing 1976 percentage uses of the top score of firms.

Actual stopwatch timings should not be claimed for performance tables unless the data is available, and audience qualification in specialized areas should be put on the front, not hidden in the preface. All these areas and more need to be clarified before this is republished.

Hopefully, AICPA will proceed with its current intentions of presenting some worthwhile material in this area – but, if it can't do better than this effort, the world will be better without any at all.

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Letters to the Editor

Cause of Death Guilt, Not Backlog

I cannot understand why *Computerworld* would publish an article such as "Data Entry Backlog Cited in Death of Motorcyclist" [CW, June 21].

It appeared to reference the data entry backlog, obviously from the headline, as a cause for the death of the motorcyclist.

The article was very clear that the individual was chased on what was thought to be a stolen motorcycle when in fact it wasn't, and data entry was the cause as it had not been correctly updated.

I'm from the old school and continue to believe that anyone who feels guilty, for whatever reason, and runs from law enforcement officers has surrounded himself with guilt and that this guilt feeling was cause of death and not the backlog in the data entry.

While the article may have been technically correct, I think it pointed negatively at the DP industry.

Jim Bybee

Monroe, Wis.

GE to Expand Also

The article "Time-Sharing Firms Go Abroad" was interesting and quite detailed, but failed to include the expansion plans of General Electric, the largest supplier of remote data processing.

General Electric has been in the international market since 1969 when it opened an office in London and it has expanded its network into over 20 foreign countries. It is presently planning to add a "Super Center" in Amsterdam, the Netherlands, as well as expanding its services in South America and the Orient.

Jerry Frese

Pasadena, Calif.

DP Not a Factor

In the July 21 issue, the headline "Data Entry Backlog Cited in Death of Motorcyclist" would lead one to think this person's death was directly caused by a DP problem, but, after reading the article, I discovered it was a simple case of a person violating the law, the police giving chase and the offender suffering from his own lack of judgment.

Was the data entry backlog really a factor at all? I think not. But even if it was, blame should be put where it belongs.

Perhaps it causes some people to feel too important when they feel they are involved in life and death situations. In some cases DP is utterly important in the continuation of human life, but whether it is or is not, sensationalism is uncalled for.

James E. Halley

Kansas City, Mo.

Infonet Omitted

The article, "Time-Sharing Firms Go Abroad" [CW, May 31], unaccountably omitted mention of Infonet, Computer Sciences Corp. (CSC) remote-services network.

Infonet has been serving Europe via satellite link to Brussels, Belgium, since early this year. Our Brussels headquarters is linked by land lines to Infonet facilities in London; Germany; Frankfurt; and Paris.

The U.S. network is also providing service via satellite to Madrid, Spain, where a subsidiary (Entel-Ibermatica) of the National Telephone Co. of Spain is establishing an Infonet network under a licensing agreement with CSC.

James Furlong

El Segundo, Calif.

Acceptance Automatic

Like many, I have followed the women's fight for equality very closely in *Computerworld* the last few years.

In the past eight years in DP, I, too, have "fought" for what I felt were my equal rights. I found, however, I was fighting against myself. When I finally truly accepted myself as a competent individual, acceptance from others was automatic.

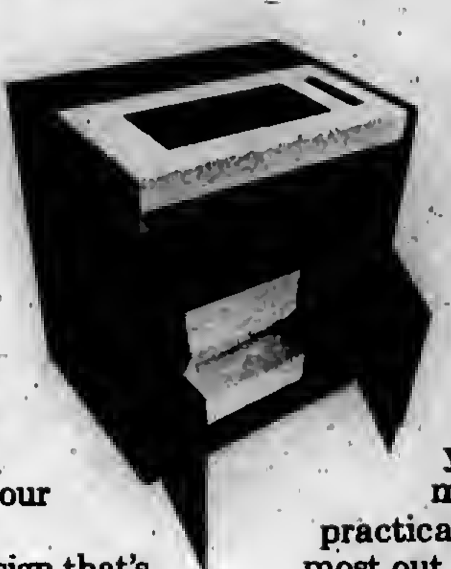
Sure there are guys around on ego trips who will feel the need to suppress women they suspect of being too sharp, but in my experience these have been the exceptions.

It hasn't been easy for the men either. They are now faced with the problem of restructuring ideas that have been instilled in them from childhood. Some, the more confident ones, have done a better job of this than others.

It's all a matter of time and reeducation. As we firmly and honestly assert ourselves as capable human beings, acceptance, as such, will follow.

W.A. Anthony

Roseburg, Ore.



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Cost System, Communication Improves DPers' Image

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The DP function today has a reputation for being unnecessarily expensive and, to make matters worse, the users of DP services many times feel that their needs are not recognized by DP and that DP seldom responds to their requests at an acceptable rate, according to P. Michael Briggs.

Speaking at a recent conference here, the executive vice-president of Atlanta-based First South Services, Inc. (FSS) said such accusations "may be true to some degree," but a good cost system and effective communication can eliminate "perceptions not based on fact" and have a major impact on the basic problems of expense and responsiveness.

Even more basic moves are sometimes needed. He noted, for example, that FSS was organized as a DP subsidiary of First National Bank of Atlanta "primarily to isolate DP costs and force development of cost communication through DP pricing."

FSS has, in fact, established good cost control with the aid of an automated financial control system which allows "good" responsibility accounting through 40 separate profit/cost centers, he said.

Carried one step further, all costs within the DP organization are internally allocated monthly to one of three major revenue producing divisions – marketing, development and production.

While costing is done in some detail, charging users for services needs to be relatively simple, in user terms and understandable, Briggs continued. All services should be charged to someone, whether in the bank, outside or internally within FSS, he said.

Pricing information is communicated to the user in "a very structured environment. Generally, unit prices are reviewed and set annually," the officer said, adding prices are given users before budget time each year.

To make sure the user can relate the prices to his area of responsibility, there is a unit price given, for example, for each demand deposit accounting (DDA) item processed rather than a charge for hours of machine time used to run the DDA program, Briggs said.

Turning the presentation to development systems, FSS vice-president Raymond J. McArdle said great care had to be taken in preparing and presenting the bill for this part of the DP operation.

The user "least understands project costing because programming projects tend invariably to take more resources and time than originally comprehended," McArdle said.

Certain criteria must be established before a customer billing system can be implemented, he said, citing fully absorbed costing, user authorization of any expenditure and the use of a single rate for all levels of systems skills as three of the basic tenets of the FSS approach.

Four factors are used in determining the single rate, McArdle went on. Administrative time (the nonbillable portion of an individual's total time), corporate overhead and total yearly man-hours of all billable personnel are all divided into the service's yearly budget.

The flat rate approach has been used for the past two years at FSS, replacing a scheme of different rates for different jobs and skills levels which suffered from "undo complexity and customer confusion," according to McArdle.

Also helping to cut through previous confusion has been the building of a communication channel to and from the customer. This was done, McArdle said, by assigning one specific analyst to each FSS customer.

Others participate in project meetings and other development efforts, but one person is responsible, he added.

To support the assigned analyst, the installation also organized a series of committees and mid- to long-term plans to keep projects moving and to allow new – sometimes emergency – projects to be handled without throwing the entire center out of kilter.

The primary goal is to get projects done close to estimated cost, he said.

In January of this year only 15% of the projects were completed within ± 10%, McArdle acknowledged, but February saw more than 40% of them within that range, and the April figure rose to more than 60%.

The FSS approach, Briggs said, has had three positive results: everyone is more aware of DP costs; that awareness has led to much more specific communication between the data center and the user, leading to operational benefits; and now "the DP organization can hope to achieve a high degree of credibility."

IDMS-Linked 'Shadow II' Features Multitasking, Access Method Choices

WELLESLEY, Mass. – A teleprocessing and multitasking monitor developed in the UK, the Shadow II system is now available in North America from Cullinane Corp.

In addition to supporting the British software in stand-alone applications, Cullinane has interfaced it with its own IDMS and is moving toward a complete integration so IBM-oriented users will have another independent source for combined data base/data communications support, according to a spokesman.

Developed by Altergo Ltd., Shadow is said to perform "all the functions" of monitors such as IBM's CICS at a fraction of their cost in storage and CPU time and to provide "many functions" not found in competitive systems.

There are, for example, modular routines capable of replacing a whole range of IBM utilities on a piecemeal basis, the spokesman said.

Specifically, Shadow software can be used in place of various data access methods including Btam, Isma, Sequential and Direct, as well as DOS and OS Multitasking, error handling and program library and load routines, Cullinane said.

Other routines provide storage management, program linkage, resource protection and time management, the vendor said.

Beyond "IBM replacement" routines, the monitor includes both batch and on-line testing aids, a fully automatic logging and recovery system and software paging with relocating loader, according to Cullinane.

Multithreading for Assembler, ANS Cobol and PL/I Optimizer programs, transaction handling and management routines and built-in support for SIGNON and password protection are also among the facilities available.

IBM 3270 screen mapping, protection against updating of records and a full master terminal operator communication system are also included.

Shadow II can run in the same partition or region as IDMS or separately.

Including the IDMS interface, it will be ready for general distribution in September and will cost $30,000 to $48,000, Cullinane said from 20 William St., Wellesley, Mass. 02181.

'Pro/Test' Adds Cross-File Standards

BEDFORD, Mass. – Simplifying the effort needed while providing the means of applying uniform rules when creating comparable fields in different test files are the twin goals of the Custom-Data Option recently added to the Pro/Test test data generator from Synergetics Corp., the vendor said.

The basic generator creates a range of test files and documentation – working from existing files, Cobol Data Division entries or user specifications – under control of parameter entries.

Until now, each use of Pro/Test had to have parameters for each field unless the user was willing to accept the built-in default options.

With the Custom Data Option, installation-specific standard test values – and, if the user wishes, the data format as well – are defined only once, according to a spokesman.

Stored in a library accessible to Pro/Test, they are applied any time the defined field is being generated, he explained.

The stored values can also be used as the basis for calculations leading to the determination of what other values in a file being generated should be.

Warehouse numbers might, for example, be directly related to parts numbers of items stored at specific locations, the spokesman suggested.

Even with the option in use, the user can override the stored definition by entering field-specific parameters during the preparation of all the other Pro/Test controls, Synergetics said.

The Custom-Data Option has been implemented on all versions – IBM DOS, OS and VS – of Pro/Test and is available free to all users of the package.

The license fee for Pro/Test is $6,900, the spokesman noted from 1 DeAngelo Drive, Bedford, Mass. 01730.

Comments Still Sought

WASHINGTON, D.C. – The deadline for commenting on proposed draft standards for Basic and Fortran [CW, April 12, 26] is now Sept. 28, according to Robert Brown, secretary for the American National Standards Institute's X3 Committee.

Once expected to end early this month, the comment period was extended when its formal announcement was inadvertantly delayed, Brown said.

Comments should be sent to Brown at the Computer and Business Equipment Manufacturers Association (Cbema), 1828 L St. N.W., Washington, D.C.

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Cobol-Based Accounting Runs on Nova

NEWTON CENTRE, Mass. – A library of interactive or batch-mode accounting applications that can be used separately or as an integrated system and written in Cobol so they can be implemented on various CPUs – including the Data General Nova – is available from Management Techniques, Inc. (MTI).

The applications include order entry, inventory control, billing and accounts receivable, the vendor said, and support for Nova users includes a separately-priced Cobol compiler that runs under RDOS.

The programs provide audit trails, support for inquiries and exception reporting; they can be run on-line or in batch processing mode, MTI noted.

The systems are available with pre- or postbilling and integrated back- and future order processing capabilities, a spokesman added.

Open and shipped orders can be accessed by item, customer, promise date and cancellation date, he said.

Inventory systems integrate raw material, work-in-process and finished goods inventory and include a system for reconciling physical to book inventory, controlling shrinkage and appreciation in both units and dollars, MTI claimed.

Designed to run on a 64K Nova or IBM 360, source code for the individual applications – in Cobol F, ANS Cobol or the Nova Cobol – starts at $5,000.

The Nova Cobol compiler is available for $3,500, he added from 28 Tanglewood Road, Newton, Mass. 02159.

DBMS Documented

NEW YORK – The March 1976 issue of *Computing Surveys*, recently published by the Association for Computing Machinery (ACM), is devoted entirely to data base management systems (DBMS).

Assembled by Edgar H. Sibley of the University of Maryland, articles cover the origin and evolution of the systems and a description of the hierarchical, "Codasyl" and relational approaches as well as a comparison of the latter two.

The soft-cover booklet can be ordered at $3 for ACM members and at $8 for others from the ACM Order Department, P.O. Box 12105, Church St. Station, New York, N.Y. 10249.

Films Show Management Choices

ENCINO, Calif. – A series of 10 management training films recently released by National Educational Media, Inc. (NEM) depict various organizational development strategies, the company said.

Applicable to all levels of management, the films are available individually so specific subjects can be studied without swamping the student with material that might, for the moment, be irrelevant, NEM added.

Titles of the major films and their respective training aims are "The Peter Hill Puzzle," accountability and cost effectiveness; "Increasing Productivity," the manager's role as change agent; "Flight Plan," planning and problem solving; "Discipline – A Matter of Judgment," objectivity in discipline; "Delegate – Don't Abdicate," delegation; and "The Time Game," time management.

Four other films devoted to communication and motivation are also available now, NEM said.

Except for "The Peter Hill Puzzle," which lasts half an hour, the films run about 15 minutes. Study material that accompanies each film was designed to be utilized more as a preview and a postshow wrap-up than as the basis for extended study, a spokeswoman noted.

Produced in 16mm or Super-8 movie film or videocassette, the full-color sound productions generally range from $250 to $285 each, with "The Peter Hill Puzzle" somewhat higher, she added from 15760 Ventura Blvd., Encino, Calif. 91436.

Comshare Tie Puts NDC On-Line

ATLANTA – The data collection and reporting capabilities of National Data Corp. (NDC) here have been linked with the interactive time-sharing and network facilities of Comshare, Inc. of Ann Arbor, Mich., under terms of an agreement recently signed by the two vendors.

Described as a "third-party supplier of cash management information," NDC collects client data via telephone, magnetic tape, terminals and CPU-to-CPU transmissions.

From this base, it provides clients with daily accounting for deposits, disbursements or balances and other management data such as sales and inventory, NDC said.

Under the NDC-Comshare arrangement, the collected data can now be transferred to Comshare's systems where it becomes available, interactively, for client-defined analysis, consolidation, regrouping or other manipulative options, Comshare said.

The combined capabilities should give corporate financial management better control over cash balances and deposits, according to Comshare.

Security measures built into both the NDC operation and the Comshare network will prevent unauthoized access to a client's sensitive data, both vendors said.

Comshare provides remote computing services to cities throughout the U.S., Canada and Europe. The corporation is based in the Woverine Tower, 3001 S. State St., Ann Arbor, Mich. 48014.

NDC is headquartered at 1 National Data Plaza Drive, Atlanta, Ga. 30359.

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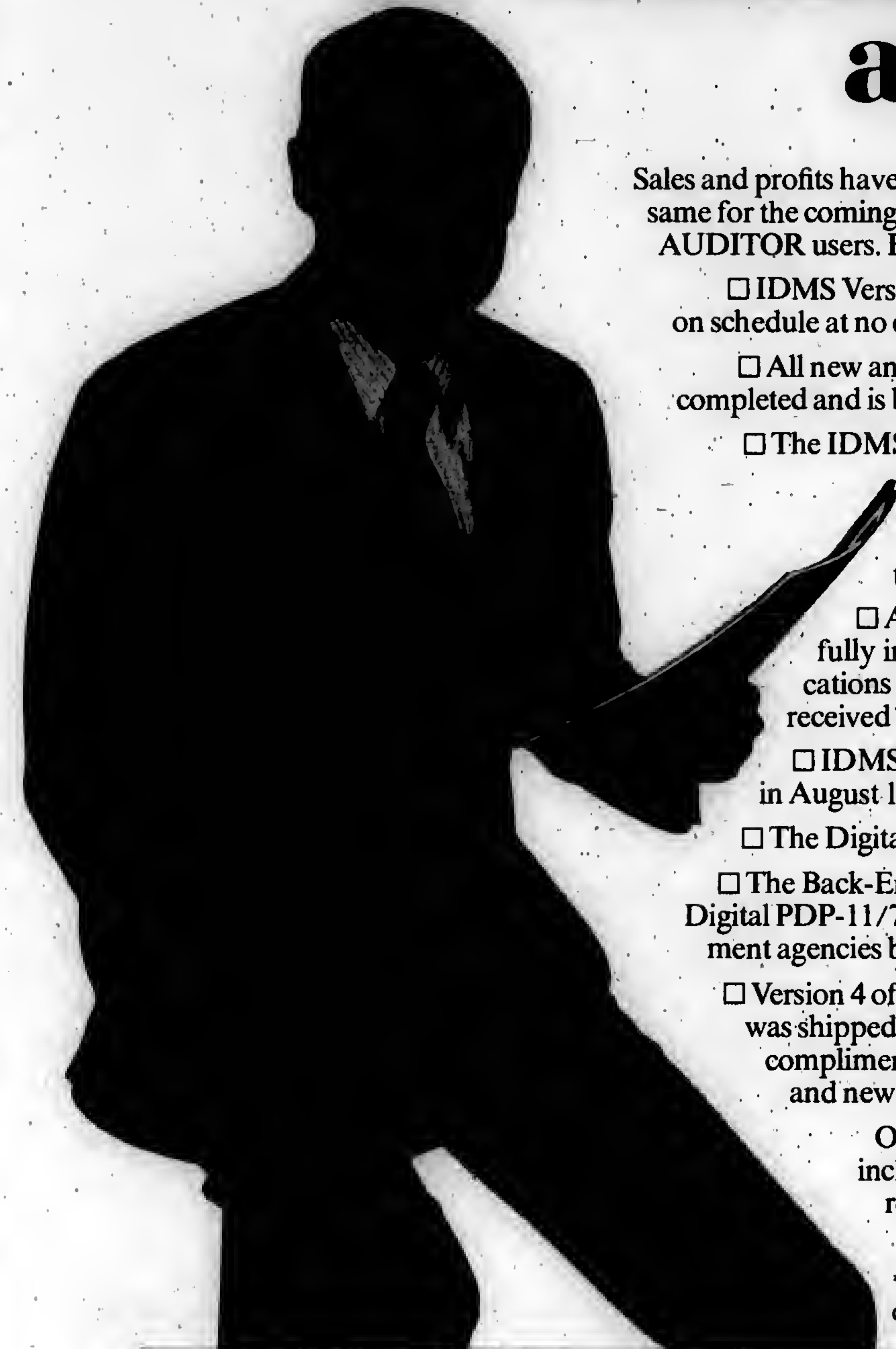

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☐ All new and greatly enhanced IDMS documentation has been completed and is being shipped with Version 4 at no charge.

☐ The IDMS and EDP-AUDITOR development and support teams have doubled in size during the past year. Senior IDMS technical support personnel have been located in New York City, Atlanta, Cincinnati, and London in addition to the already existing locations.

☐ A communications monitor has been acquired and will be fully integrated with IDMS to support a high volume communications environment. This product is so good that we have already received many orders for it.

☐ IDMS On-Line Query (Version 1) will be ready ahead of schedule in August 1976.

☐ The Digital PDP-11/70 IDMS version is operational.

☐ The Back-End Database Management System project (interfacing the Digital PDP-11/70 to the IBM 370) is underway for delivery to four government agencies by February 1977.

☐ Version 4 of EDP-AUDITOR/CULPRIT with all new documentation was shipped in May at no charge to users. We have received many complimentary letters about the documentation, ease of installation, and new facilities of Version 4.

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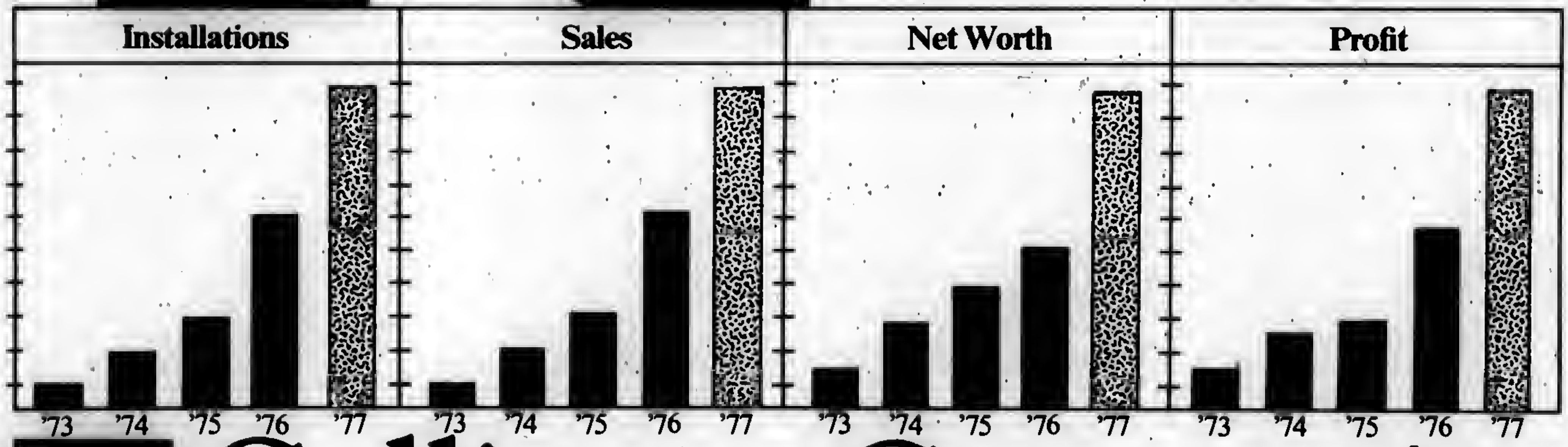

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'Egoless Leadership' Seen Key to Growth Out of DP

Peopleware

By Jack Stone

Special to Computerworld

"Computer center managers are never promoted to executive ranks. They don't have the leadership qualities to make the grade. You know the problem – too much ego involvement.

"As a result, we ignore DP managers in our searches for corporate officers and top executives."

These startling statements were made recently by a principal of a major executive search firm.

Challenged on such sweeping generalities, he replied, "I know it's ironic, perhaps bizarre. American computing centers have such vast number of intellectual and creative people, and so little in the way of executive talent."

My immediate reaction was skepticism. But it is true, individuals rarely arrive in the executive suite with a DP management background (DP vendor organizations are, of course, not part of this discussion).

To characterize the reasons why DP managers are not generally promoted, I would suggest most of them do not practice the craft of "egoless leadership," a term I have coined from the lead provided by that search firm executive (and consistent with "egoless programming," the term developed by Gerald M. Weinberg in his book, *The Psychology of Computer Programming*).

I define DP egoless leadership as a management style in which actions are taken based on total organization needs rather than the needs of the computer center alone. Such actions fall into the areas of people, performance and profitability, each of which happens to be of vital concern to the executive office.

As an introduction to two lecture/presentations I conducted recently before national DP management and supervisory audiences, I conducted "show-of-hands" polls on audience views of human relations in the computer center. Nearly all members of both audiences agreed we had "people problems."

Queried further, majorities of both groups indicated problems in every major category of personnel: analysts, programmers, operators, end users and top executives. (An exceptionally large number of attendees even identified themselves as the problem!)

These results are consistent with my prior experience: human relations in the DP environment (my estimate: 85% of the installations) are generally in a deplorable state. And the situation extends to virtually every human facet of the business: employee satisfaction, supervisory skills, user/center communications, performance accountability, executive control over DP, technical training levels, Equal Employment Opportunity, management delegation and job enlargement, to note a few.

I'm afraid we must "pin the rose" on the senior DP manager for the current state of affairs. Let's take one case in point – center/executive relations. In spite of the DP manager's usual (and probably justifiable) complaint that top executives have not met center requests for human resources to do the job, the fact remains that the organization looks to this DP manager for leadership in both defining and explaining resource needs to the executive suite.

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations and personnel management.

Selected letters will be published in Computerworld, *along with commentary by Stone, in a column beginning next month.*

Letters should not exceed 500 words and should include the name, title, organization and address of the sender for ackhowledgement purposes. This information will be treated as confidential and withheld from publication unless authorized for release by the sender.

If there is one consistent complaint from the top floor, it's the continuing fog that seems to surround center requests for increased head count. Many centers leave the impression their tasks are so crucial that their resource requests must go unchallenged, irrespective of other needs in the organization.

But executives are hardly disposed to release precious manpower slots when they feel they are being kept in the dark.

Another case relates to user/center relations. Granting the difficulties in getting these two cultures to coalesce, executives nonetheless expect computer center management to find the pathways to detente and peaceful coexistence.

However, few senior DP managers have succeeded in soothing the unending conflicts between these departments.

Finally, regarding computer center personnel, many center managements seem to bolster the notion they are the elitist groups in the organizations by virtue of its control over this incredible electronic wizardry – the computer mystique personified.

Yet it is often these same centers which suffer the most difficult personnel problems (a sure sign, according to many executives, of managerial ineffectiveness), occupying much time and energy of the executive staff, a situation which tends to dissolve the value of other DP management capabilities.

I submit that executives are also tiring of the organization dislocations engendered by the center in the area of personnel policies. The high salaries, odd working hours, special training programs, select offices, etc. presumably necessary to attract talented DP people have also served to cause deep feelings of resentment in those long-established departments which do not have similar compensation and fringe benefits.

It appears much can be done by DP managers to enhance center performance and their acceptability in the organization by moving toward egoless leadership, being particularly sensitive to the consequences of their actions upon the total organization, the people involved and their own status as viewed by top executives.

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COMMUNICATIONS

FCC Judges Find DDS Pricing Discriminatory

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Two administrative law judges of the Federal Communications Commission (FCC) have found AT&T's Dataphone Digital Service (DDS) rates are unjust and unreasonable.

If this decision is allowed to stand, it could mean higher DDS rates for data users. But it is expected that AT&T will object to the decision, beginning a continuing regulatory process that would block any DDS rate change for at least six months, according to an FCC staff source.

AT&T failed to demonstrate DDS rates were just and reasonable, and Bell revenues were "greatly overstated" while investment and expenses were "substantially understated," the FCC judges ruled.

"In its zeal to develop an extremely competitive rate," AT&T deliberately gave the low-speed 2,400 bit/sec DDS user a cost advantage; this was "open, notorious discrimination," the judges said.

Since AT&T admitted there was little increase in cost with increase in speed, there was no reason why users operating at 4,800- and 9,600 bit/sec and 56 kbit/sec should pay "disproportionately higher charges for service than lower speed users."

As a result of this discriminatory rate structure, both DDS local distribution rates and longer distance rates between digital serving areas "discriminate against the higher speed user," the decision said.

According to the ruling, AT&T also discriminated in its pricing associated with the DDS Channel Service Unit (CSU) and Digital Service Unit (DSU). DDS customers should be charged only for the CSU or DSU units which they elect to use and the DDS tariff should be restructured to eliminate CSU costs as a basic element, the decision said.

Commenting on the decision, AT&T said it was in "substantial disagreement" with the findings. "It is our position that present rates and regulations for DDS are just, reasonable and lawful in all respects," an AT&T spokesman said. "We will file our objections at the appropriate time."

The DDS tariff first went into effect in five cities. Nineteen cities were later added which had to operate at rates no lower than those offered by other carriers.

The net effect of this was a two-tier price for DDS with some users paying rates as much as 40% higher depending on whether they were in the first five (lower rate) cities or in the next 19 (higher rate) cities. A single rate structure is now in effect.

If the current findings are allowed to stand, AT&T will have to file new DDS rates eliminating the discriminatory aspects spelled out by the FCC judges.

AT&T has until Aug. 2 to file exceptions to the ruling. If none are filed, the decision would become effective in 50 days. The AT&T objections are expected to be filed within the required period.

With SDLC System

Bank's Supermarket Terminals One Step From EFT

By John P. Hebert
Of the CW Staff

WILMINGTON, Del. – The Wilmington Savings Fund Society (WSFS) here has begun using a system described as one step away from electronic funds transfer (EFT).

The bank has installed communications terminals at four local supermarkets to make semiautomatic debit entires to a customer's checking account when a check is cashed, WSFS senior vice-president William H. Robinson Sr. said.

By August or September, Robinson said, the terminals will be working at 26 area supermarkets, replacing a manual system in which grocers handle the bank's plastic identification cards and standard form checks that permit customers to cash checks up to $100.

Because the bank felt it wanted "the exposure" of guaranteeing checks for that amount of money for 30,000 WSFS customers, it also wanted the security afforded by the speed of on-line operations to immediately verify account status, he said.

At present, four IBM 3606 financial services terminals are carrying out the initial phase of the on-line operation by recording customer and account information on any check cashed up to $200 and sending the information to the IBM 370/145 CPU at the bank's headquarters, which immediately verifies the customer and amount.

Since the mainframe at the bank is not used to update checking account information, however, the data is unloaded from the system's disk drives at night and brought to a local service bureau for processing, according to Arthur Hooper, the bank's senior vice-president responsible for DP.

The terminals have been added to an on-line network comprised of IBM 3604 teller terminals working under an IBM Synchronous Data Link Control (SDLC) line discipline in each of WSFS' 18 branches, Hooper said.

Customer account information from the supermarket-based portion of the system enters and exits the 4M-byte DOS/VS CPU under IBM's Virtual Telecommunications Access Method (Vtam) through an IBM 3705 controller working under IBM's Network Control Program.

From there, it passes through a 36K-byte 3601 communications controller and out of the bank over private lines at a maximum 1,200 bit/sec. The lines can take up to 2,000 bit/sec transmission, but the modems in the 3705 controller only operate at the lower speed, Hooper noted.

The 3601 controller can handle up to six loops, but WSFS is using only three of them. At each terminal node in the loops is an IBM 3603 modem to assure continuity back to the CPU.

The system thus far has reduced the cost of handling each individual document at the supermarkets by 3.1 cents as a result of direct data capture on the terminals and has also reduced processor costs from 9 cents per item down to 1.5 cents, Robinson noted.

The only major problem in having the terminals installed at supermarkets, Robinson said, was that store officials stipulated that WSFS would have to get other banks to use the same terminals for their customers.

The grocers made these conditions because "none of them want five different terminals in their stores working with five different computer systems" because it would make their tellers' lives difficult, he said.

(Continued on Page 18)

Resale, Sharing of Private-Line Facilities Allowed

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has issued a ruling that will allow private-line users to share or resell their facilities "without restriction or undue discrimination."

In its decision, the FCC said "present tariff restrictions on the resale and sharing of [private-line] services are unjust, unreasonable and unduly discriminatory." The commission gave common carriers until Sept. 1 to file revised tariffs eliminating current restrictions.

Sharing and resale will result in more efficient use of facilities, cost savings for many small users and innovation in the devices to be used on shared networks, the FCC said.

Commenting on the ruling, Thomas Nurnberger, executive vice-president of AT&T, said "this decision appears to extend resale and sharing into areas where few if any will benefit at the expense of many."

The decision will allow "middlemen" to come between the customer and the telephone company, thus removing the phone company's "clear-cut responsibility for service," he said.

The decision is expected to benefit smaller users who will now be able to pool their private lines on a shared basis. This type of arrangement apparently will be allowed as long as no user makes a profit from the arrangement, according to one Washington source.

The commission apparently released the full text of its decision to a few selected publications. Representatives of Telenet, Tymshare and other interested firms said they had not seen the full decision.

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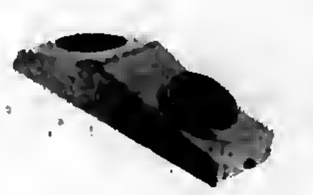

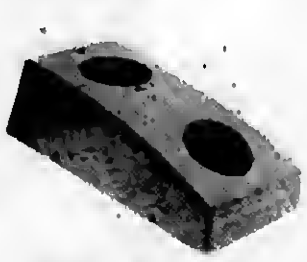

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Net Provides Services for Pharmacists

By John P. Hebert
Of the CW Staff

MELROSE PARK, Ill. – A drug wholesaler based here has launched the first phase of an on-line computer-based retail pharmacy information system which utilizes computer terminals located at stores of subscribers to the system.

The Community Pharmacy System (CPS) aids the pharmacist by carrying out the combined tasks of accessing patient profiles and providing drug label information, prescription pricing and third-party billing – things previously done manually which kept customers waiting, according to Tom Sucher, vice-president of systems development at Applied Health Care Systems, Inc. (AHCS).

A wholly owned subsidiary of Louis Zahn Drug Co., AHCS is presently placing pilot pharmacies on the computerized system, having only begun operations last January, Sucher said.

CPS is centered around a Data General Corp. C-300 central processor with 96K words of core memory running under Fortran IV application programs. A Data General S-200 CPU serves as a front-end message-switching system comprised of a Data Control Unit and multiplexers, Sucher said.

Information contained in the C-300's data base on 90M-byte disk drives goes out to the drug retailers through ICC/Milgo 2200/24 modems over full-duplex multidrop leased communication lines at 2,400 bit/sec.

At the retail site, pharmacists receive the information on an ICC/Milgo 40+65 CRT and an ICC/Milgo 40+20 line printer after the data has passed through another 2200/24 modem.

AHCS also has ICC/Milgo 3300/36 modems to which the company will eventually move for a transmission speed upgrade to 3,600 bit/sec for customers who need that capability, Sucher said. An upgrade to 4,800 bit/sec transmission is also possible – it would allow more drops to come off the same line and support more throughput in less time, he said.

Simultaneous Use

Each CRT and printer terminal can be independently addressed and polled, Sucher said. Each terminal has a different minor address within the major address of a particular customer so, when the CPU polls the terminals for information, it can go to either the printer or the CRT. This allows simultaneous use of both units, he explained.

All parts of the system except equipment at the customer site have full backup capability to assure system reliability, he added.

Retail pharmacies who subscribe to CPS do so through a minimum one-year contract. A basic charge of $375/mo covers the installation and support of the terminals, modems and communication lines, he noted.

Less Waiting Time

The system promises to "drastically reduce" waiting time for both new customers coming in for prescriptions and particularly for customers with information already on file, according to Sucher.

In the latter case, a full information turnaround from time of inquiry to the time of receipt is 15 seconds or less and includes pricing information and prescription label printing, he noted.

If a patient profile (containing the patient's medical history and drug interaction information) is requested by the pharmacist, the total response and printing time is about one minute.

The speed of the printer is either 66 line/min or 125 line/min, he noted.

Initial Problem

During the system's initial implementation, a communications problem cropped up when the asynchronous terminals couldn't get through the synchronous lines to the S-200 message switcher or the CPU.

AHCS installed a "little black box" made by Arc Electronics in Florida which synchronizes the S-200 and the communications system, Sucher said, adding no other major problems were encountered.

While AHCS gets a firm footing with the first phase of CPS, it is planning for future aspects of the system, including offering a similar service to drug stores at nursing homes and at hospital pharmacies, Sucher said.

Bank One Step Away From EFT System

(Continued from Page 17)

The major problem in switching to a fully automatic system, according to Hooper, is the software problems associated with all of IBM's control programs for the network.

As a result, the plan for WSFS' system called for a cooperative effort with other banks once the terminals were installed and proven useful. WSFS is following American Bankers Association standards in implementing the system, he said.

System Made for Sharing

Other area banks came to WSFS when the system was being planned to make sure it would be compatible with their systems, Hooper said. When others use the system, there will be a service charge for use of the terminal.

WSFS designed the system to be shared, he said. As a result it acquired the additional terminal equipment on a six-month purchase option and will be renting it for a year.

"If there is no participation, then we don't know what we will do," he added.

But even if there is participation, WSFS doesn't know how it will set up the final message-switching system to make EFT of customer accounts possible. The plans call for electronic switching to the local service bureau, but there is the problem of which bank would be the switch, Hooper said, adding the bank chosen will charge the other member banks for that service.

"These software problems are new to IBM. They don't know how to answer the questions and solve the problems," he said. "IBM and the telephone company are making a fortune from [the bank's] network."

No Carriers Around

There were no specialized carriers offering communications services in the area, he said, indicating the bank otherwise might have gone with a specialized carrier to reduce costs.

The next move toward a true EFT network, not only for checking account debiting from local supermarkets but also for EFT transactions for mortgage payments, loans, and the bank's Christmas Club, will be the installation of "brand new" IBM equipment, which Hooper said is "the only way to go."

The device, an IBM 3602 communications controller with 5.2M-byte disk packs, will replace the 3601, eliminate some functions of the 3705 and allow the bank to put its customer account files on the unit to reduce CPU overhead, Hooper said.

"We're trying to let the system evolve, rather than putting it all in right now and letting the technology advance to help give us answers to questions," he said.

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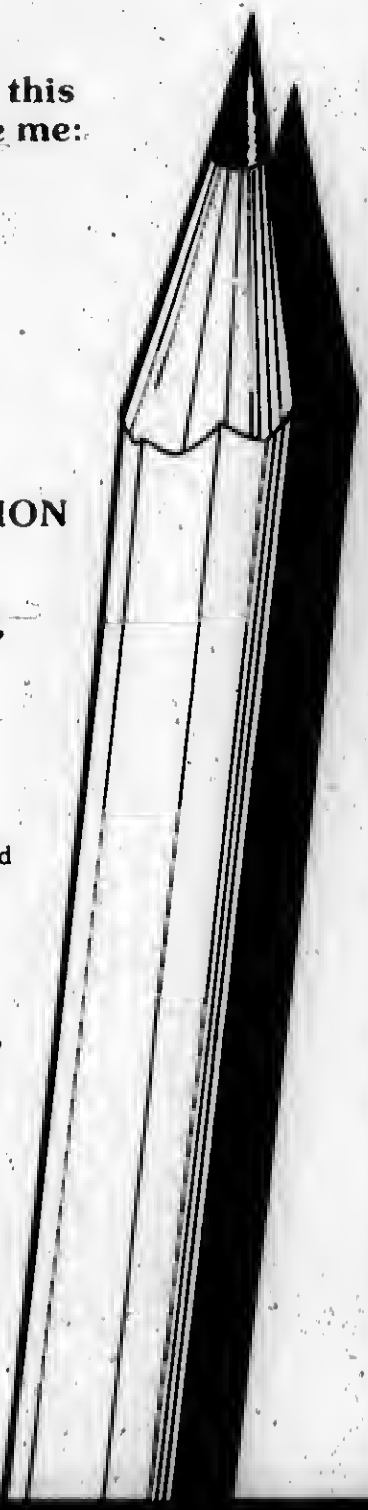

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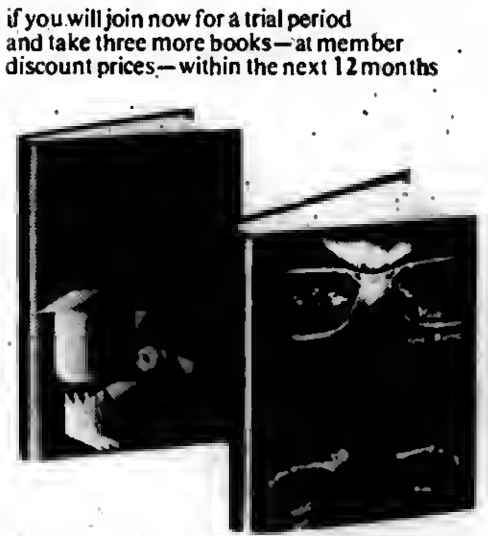

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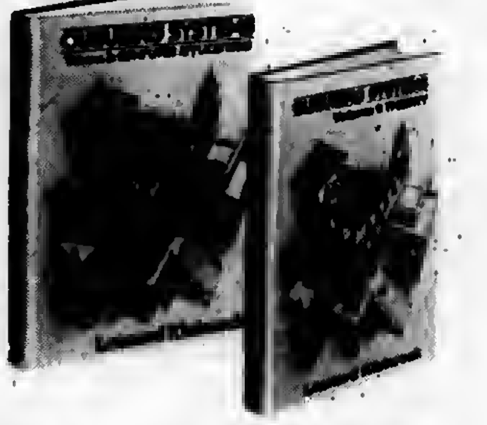

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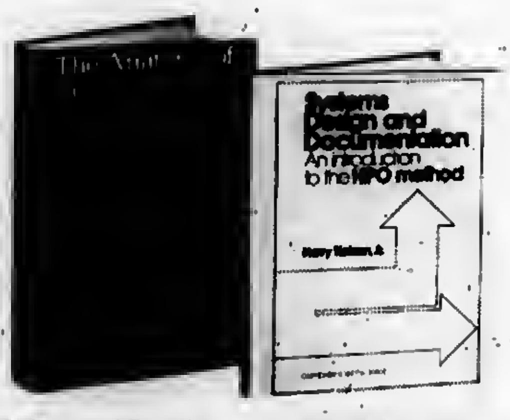
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WUIS Inaugurates Net Processor Series

MAHWAH, N.J. – The System 4100 from Western Union Information Systems (WUIS) marks the beginning of a family of intelligent network processors designed to modularly configure distributed and hierarchical networks.

With the System 4100 network processor, users gain communications features such as dynamic reconfiguration, network performance statistics accumulation and centralized network control, according to a company spokesman.

System 4100 is an intelligent time division multiplexer (TDM) which can accommodate a range of communications interfaces for synchronous and asynchronous terminals, WUIS said.

It reporteldy can allow multiple terminals to be multiplexed onto one truck line operating in point-to-point configurations at throughput rates up to 9,600 bit/sec in each direction simultaneously.

The system terminates synchronous terminal lines with speeds up to 7,200 bit/sec and asynchronous lines with speeds up to 1,200 bit/sec, the company said.

The system is said to be able to handle dial-up or dedicated communications lines in two- or four-wire and half- or full-duplex configurations with current loop, RS-232 or CCITT V.24 terminations.

The networking system can handle up to 20 asynchronous or synchronous lines and can look at up to 64 lines in hard-wired configurations, the spokesman said.

The operator panel in the 4100 unit allows system personnel to monitor the equipment, analyze internal operations, localize hardware and network malfunctions and can also be used to reconfigure the network, WUIS said.

A basic 4100 with 8K of memory, two 1,200 bit/sec asynchronous lines and the system operator panel for diagnostics costs $3,620, while a similar system with 20 asynchronous half- or full-duplex lines is priced at $6,590, the spokesman said.

An optional 4,800- or 9,600 bit/sec modem to work in conjunction with the TDM costs an additional $6,500; a 20-line TDM system would cost $13,900, the spokesman said.

A series of products based on the 4000 series has been planned with increased capabilities afforded by dual and triple microprocessor systems that will be able to handle up to 50 kbit/sec transmission speeds for higher throughput, the spokesman said.

The first of these machines will be the System 4200, which can be configured as a complex TDM or as a network concentrator, he said.

Delivery for the 4100 is in 90 days and deliveries for the 4200 are scheduled to begin in the first quarter, WUIS said from 82 McKee Drive, Mahwah, N.J. 07430.

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Bell 208A-Compatible Modem Features Adaptive Equalizer

FORT WASHINGTON, Pa. – A Bell 208A-compatible modem introduced by Tele-Dynamics is said to feature an all-digital adaptive equalizer which affords maximum convergence and prevents drifts and other analog errors.

The Model 7208A 4,800 bit/sec modem provides full-duplex, half-duplex or simplex transmission for point-to-point or multipoint polling operations, according to Tele-Dynamics.

The device has built-in on-line and off-line test capabilities with front panel controls and diagnostic lights as standard features, a spokesman added.

Other features include both common-carrier and terminal loop-back provisions for system troubleshooting, a connector for remote test access and a separate barrier strip for ease in connecting telephone lines, the company said.

The 7208A is priced at $3,250 with quantity discounts available, Tele-Dynamics said from 525 Virginia Drive, Fort Washington, Pa. 19034.

TDM Handles 72 kBit/Sec Rates

WILTON, Conn. – General Datacomm Industries, Inc. has a time-division multiplexer (TDM) capable of operation up to 72 kbit/sec, the firm said.

The TDM 1205 incorporates up to 14 channels of single or mixed data rates and includes such features as automatic channel alarm, tandem systems diagnostics, automatic maintenance and in-service channel validation, it noted.

The device optimizes multiplexing efficiency through utilization of character interleaving and has the strongest available synchronization system, the company claimed.

It can be configured in multiples at a central location to provide star node operations over an unrestricted number of high-speed lines to remote locations, it said.

Common logic and power is said to be provided individually for each line to preclude multiple city outage resulting from failure.

The TDM 1205 costs $1,450, General Datacomm said from 131 Danbury Road, Wilton, Conn. 06897.

Sycor Has 2,400 Bit/Sec Modem

ANN ARBOR, Mich. – Sycor, Inc. has a 2,400 bit/sec modem for use with the company's terminal systems.

The LSI modem interfaces with an RS-232 signaling device and produces a Bell 201 B/C-compatible output for transmission over leased or switched lines, Sycor said.

Features include answer-back tone, automatic answering, carrier detect, clear to send delay, local copy, MARK hold on forward channel receive data when carrier is lost and soft carrier turnoff, according to Sycor.

The modem is available in a desktop or wall-mounted housing for the 340/350 and 250 terminal systems. For the Sycor 400 series, the modem is a plug-in module to the control unit.

The unit is priced at $60/mo on a one-year lease, including maintenance, and carries a purchase price of $2,000, Sycor said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Correction

The Gandalf Data, Inc. standard LDS 309 data set [CW, June 7] is a six-speed device which transmits at speeds of 1,800- to 9,600 bit/sec and costs $786 with an option adding speeds of 14.4- and 19.2 kbit/sec. The unit seils for $900

That's important to remember with high-density drives.

The advantages to 6250 CPI recording — like higher data transfer rates and a reduction in library size requirements — are numerous.

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Bits & Pieces

Cognitronics Adds Diskette As Option on System/70

STAMFORD, Conn. – Cognitronics Corp. has announced the availability of Diskette Unit No. 670 on its System/70 optical character recognition (OCR) equipment.

The optional unit is a removable information storage diskette fully compatible with the diskette in use with the IBM 3740 or 3600 diskette systems.

With this unit, System/70 OCR users can achieve cardless/tapeless data entry to IBM 370 computers, the firm said.

The diskette unit is a complete, self-contained subsystem packaged in a single compact cabinet, housed in the System/70 desk below the CPU unit. A door on the front panel permits easy access to the drive unit for diskette insertion and removal, according to Cognitronics.

The Model 670 disk recording surface is divided into 77 concentric tracks including an index track. Each usable track is subdivided into 26 equal sectors, individual records capable of recording 128 bytes of data, Cognitronics said.

With the maximum number of tracks used, a full disk will contain 1,898 disk records. Users can vary the record lengths and number of sector records per document, according to Cognitronics.

The unit rents for $190/mo and can be purchased for $5,950 from Cognitronics at 41 E. 28th St., New York, N.Y. 10028.

Package Trains, Evaluates Operators

NEW YORK – A packaged program on "Keyboard Effectiveness Training" is now available from Advanced Keyboarding Systems (AKS).

The service package was prepared to include fundamental elements while allowing the individual needs of a company to be incorporated into the program, according to the firm.

Package features include the testing and evaluation of each operator for alpha and numeric keyboarding skills, including error patterns and speed, and the compilation of a profile of each operator specifying the training needed to improve productivity, AKS said.

Remedial training, conducted in the company's own production environment, involves two or three operators at a time, rotating throughout the group, so as not to disrupt ongoing production, according to AKS.

The training program is said to be flexible enough to suit any size company. A typical three-week program for up to 12 people costs approximately $3,750, AKS said from 437 Madison Ave., New York, N.Y. 10022.

Working on Problems, Head Says

Common Adapts to Changing User Base

By Don Leavitt
Of the CW Staff

MONTREAL – As the user group for small IBM systems, Common has some problems as the equipment base changes, "but I'm convinced we're working toward solving them and perhaps setting precedents for Guide and Share," two other IBM users groups, Jim Deck of Inland Steel's Research Labs said here recently.

"We're adapting our program and our organization to meet the real world out there, and both IBM and our membership are responding very nicely," Common's president added in an interview during the group's semiannual conference.

The group is still small – with approximately 420 members across the U.S. and Canada – but 250 or so turned out for this meeting, which Deck and other Common officials took as a vote of confidence in the way things are going.

Part of the group's problem results from IBM's withdrawal of support for the machines around which Common was formed – the IBM 1130 and the 1800, Deck said. In many respects, the vendor has not come up with truly effective alternatives to these CPUs, he added.

And the users of IBM's current line of small systems – the System 32 and 3 and the 5100 – "simply have a different level of interfacing with their equipment" than the 1130 and 1800 users, so it is hard to find common interests, he said.

But new IBM-based users are the other confusing factor, he added. Other vendors have developed hardware systems that are directly compatible with IBM's operating systems and applications for the 1130 and 1800 or that can use the software with only minor modification. But these haven't been a disruptive influence, Deck continued.

Common members who have shifted to such non-IBM gear can petition the group's board of directors to retain their status with the potential for working on mutual problems. At the same time, Common has a "no-sales-pitch" policy which locks out vendor representatives except for technical personnel who have been invited to address the group.

Peck saw Common's resolution of this problem as an example Guide or Share might be able to follow in coping with vendors of larger systems such as the Amdahl Corp. 470 "which has to be of legitimate interest" to the large-scale 370 user.

Common's meeting format has changed over time as the needs of the members varied. There is very little "Hey look, this is how I did it," Deck noted. Instead there is a growing emphasis on workshops, seminars and other sessions getting to know specifics about the different types of equipment covered by the group's membership.

Interest in these working sessions has reached the point that Common is now considering putting them "on the road" as stand-alone meetings to be sponsored in various cities around the country, he said. This venture in sharing ideas with users – in or out of Common – may get under way in September, Deck said.

Common is headquartered at 435 N. Michigan Ave., Chicago, Ill. 60611.

Hospital Uses Flexible Disks To Record Brain Scanning Data

HOUSTON – At the Methodist Hospital here, flexible magnetic recording disks are proving to be the most convenient method of recording, storing and displaying patient data gathered by Computerized Axial Tomography (CAT), a new technique for brain scanning.

CAT scanning helps improve the accuracy and speed of doctors' diagnoses by detailing three-dimensional portraits of slices of the human brain from 28,000 X-ray absorption valves.

A narrow slit X-ray beam scans the patient's head and emergent photons are detected. The 28,000 absorption readings are made in five minutes, using one-third the X-ray energy of conventional X-ray techniques to obtain 100 times more information.

At Methodist, CAT scanning has largely replaced conventional X-ray filming for use in diagnosing neurological disorders. Markette flexible recording disks from Memorex Corp. are used to store the absorption readings.

A single flexible disk used for one patient is more convenient than storing many patient records on magnetic recording tape, according to Dr. Robert A. Evans of the radiological department at Methodist.

"By including the random access disk in the patient's X-ray folder, it is possible to retrieve the information immediately without searching a magnetic tape recording of the digital data of scores of patients. The disk can also be reused as soon as the legal responsibility to preserve the medical record of the patient has expired," Evans said.

The absorption readings are stored in the scanning system's on-line memory. A recording system linked to the secanner transfers each patient's data onto the flexible disk which is then played back in an off-line processor in the radiologist's office.

This off-line processing system contains a microcomputer, full-color screen display unit and an electrostatic printer.

Hard-copy pictures used for conferences and reports to referring physicians are made up of the individual absorption coefficients depicting tissue densities using the off-line processing system.

NCR Key-to-Cassette Unit Bows

DAYTON, Ohio – A numeric-only, key-to-cassette data entry device has been announced by NCR.

The NCR 7218 numeric data entry device is for use with systems such as the NCR 250, 399 and 499 and the NCR Century 8200 minicomputer which use magnetic tape cassettes as input or processing devices, the firm said. The cassettes can also be used with NCR Century mainframe computers and the recently introduced Criterion Series which can be equipped with cassette reading devices.

The microprocessor-based 7218 allows users wide latitude in designing data formats, NCR said. Up to 30 different data fields are available for each application. Data blocks recorded on tape will vary in size from 20 to 256 characters, but will always be the same size for any one application. Each cassette has a total capacity of 312.5K characters, NCR said.

In a typical operation, the data format is read into the 7218's memory using magnetic tape cassette. Using the numeric key pad and function keys, the operator then enters data. Each entry is printed on a journal tape, providing a complete audit trail, according to the vendor.

The 7218 has a 16-character keyboard buffer that permits continuous data entry to be time-shared with recording and printing. It can accept up to 10 char./sec and a two-key rollover feature permits the operator to press a second digit key before the first has been completely released.

Included in the 7218 is a built-in, five-function printing calculator with its own auxiliary memory and totaling register.

The standard 7218 has a 14-digit register for storing signed totals. Two additional registers are available as options.

The 7218 will be available for customer delivery in the third quarter with prices beginning at $2,275, NCR said.

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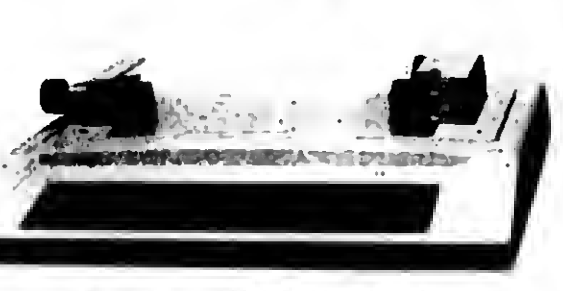

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During Quiet Daytime Hours

Bank Takes Up CPU Slack By Developing County Jobs

CANTON, Ohio – Recognizing nearly all of its DP begins after the day's transactions are completed, Harter Bank and Trust Co. is utilizing its otherwise-quiet daylight hours for the development of a voter registration and jury selection system for Stark County in Ohio under contract from the country commissioners and Board of Elections.

The on-line, real-time system, said to be one of the first of its kind in the country, consists of an IBM 370/145 connected to Memorex 3670 disk drives operating under DOS/VS. Access to data is achieved through the use of CRT terminals located at various points throughout the network.

After being awarded the contract, Harter Bank purchased two of the dual-spindle, 100M byte/spindle Memorex drives to store 170,000 voter files in addition to its own banking records.

In selecting Memorex equipment over the mainframe manufacturer's drives, Philip Morgan, vice-president of computer services for the bank, cited several factors.

"We needed the storage capacity offered by the 3670 equipment, so adding more 2319 drives with only 29M-byte capacity to those already installed was ruled out," Morgan said. "We decided on the 3670s for reliability, performance and economy considerations."

The on-line registration system, which is scheduled to be ready by the November election, will enable the updating of voter records such as the addition and maintenance of registrations in only minutes.

For a voter registration, the computer system will perform verifying functions such as checking for duplicate names in the voter list, checking for other voters at the same address, as well as verification of the address.

Once the voter file is built and operational, a system for random selection of jurors will be instituted, which is expected to cut the time required for jury selection to only 100 hours from a current 1,600 hours annually.

The voter registration and jury selection system will use four remote CRT terminals – three at the Board of Elections and one at the courthouse. A hard-copy printer at the Board of Elections will permit printing of registration cards used by the poll workers.

"We have worked out an arrangement with the board and the county giving them access to the computer at established times," Morgan said. This will allow the bank to perform its own processing requirements.

MDR Mark Reader Made Interactive With Controller

PASADENA, Calif. – The Business Data Products Division of Bell & Howell has introduced an intelligent controller system for use with its MDR series of optical mark readers designed to expand their capabilities from those of simple data entry terminals to those of intelligent interactive terminals.

The controller permits users to enter, edit, format and transmit transaction-oriented data to a host computer using the MDR readers as interactive terminals similar to the IBM 3275.

The controller itself is an adaptation of the microcomputer in Bell & Howell's IMR-80 line of intelligent mark readers. But where the IMR-80 is aimed at batch applications, the Intelligent Mark Document Reader (IMDR) is aimed at the interactive or transaction-oriented world, according tothe firm.

The system accepts input in the form of punches, pencil marks, preprinted or computer-generated data and can read, edit and preprocess the information prior to transmission to a host computer.

The controller system gives IMDR users a number of performance options, the firm said. For example, it permits switchable selection of either synchronous or asynchronous communications. It also provides switch-selectable transfer rates.

It will support Teletype-compatible CRT devices or keyboard printers via an output port with switch-selectable current loop or EIA interfacing. A second parallel output is provided for a line printer.

With the installation of an expanded memory board, the IMDR devices can support binary synchronous protocols emulating the IBM 3275.

Lease prices for the IMDR begin at $250/mo from Bell & Howell at 360 Sierra Madre Villa, Pasadena, Calif. 91109.

A Statement of Our Objectives:

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ON

DP-Based System Makes Locating Police Data a Snap

By Catherine Arnst
Of the CW Staff

LEWIS COUNTY, Wash. – A system that keeps track of arrest records, fingerprints, complaints, mug shots, stolen property reports, firearms permits and other pertinent data "has to be seen in action to really be appreciated," according to an officer of the Sheriff's Office here that is using it.

The Law Enforcement Applications Package (Leap) was installed last December and allows designated personnel working in Records and Identification to match new information to pertinent data in the files.

The data is stored in a Micro 4000 computer controlled records management system that is interactive with a Recordak Microstar reader/printer. The equipment is supplied by Zytron Data Systems and Eastman Kodak Co.

When an officer is given a partial description of a suspect in a criminal case, he can use a terminal to feed the information into the system, which then searches for parallels.

"For instance, if a suspect is male; white; about five feet, nine inches tall; and weighs around 200 pounds, we type this information into the terminal, which tells us in seconds how many suspects in our files match that description.

"The data is visually displayed on a CRT screen, which also is used to guide operators through the various steps of search and inquiry," Michael L. Daws, records and identification officer for the sheriff's office, said.

After displaying the number of matching records, the terminal "asks" whether the operator wants to search the computer or the film files for individual persons. In either case, the identification numbers of the appropriate computer records or the film magazines and image location are displayed on the terminal screen.

If the operator searches the microfilm files, the indicated magazine is loaded into the reader/printer. The image number is then transferred from the computer memory through an interactive teletypewriter terminal to a Recordak image control keyboard linked to the reader/printer, which automatically displays the microimage of the record.

The Sheriff's Office began looking into the use of both microfilm and DP techniques for storing information in mid-1974, Dawes said.

"We had our records, some dating back to 1919, in 34 four-drawer file cabinets, and we were running out of space. Things improved somewhat with the use of a mechanized filing system capable of holding around 20,000 folders in 12 rotating carriers. But, even so, there were still around 10 four-drawer cabinets and we were adding new records every day," he said.

The Sheriff's policy is to keep all arrest records active until the person involved reaches age 50. After that, the file is deactivated only if the person has gone seven years without an arrest.

With the cumbersome files, it sometimes took as long as two days to locate a previous arrest record, Dawes said. There were also times when the information needed to make an identification was in the files, but there wasn't the time or means to find it, he added.

The Lewis County Commissioners agreed in mid-1975 to use around $100,000 in revenue-sharing funds to initiate Leap.

Codes Assigned

Original documents are recorded onto 16mm microfilm which is processed by Kodak and sent back to the Sheriff's Office. There a seven-digit retrieval code is assigned to each document image. The first three digits identify the film magazine and the next four the image location.

Dawes started microfilming arrest records in September 1975, three months before the Micro 4000 was installed. Complaints, stolen property records and firearm permits were added in June.

Mug shots and fingerprints will be microfilmed this month and separate magazine files will be kept for each. Folders will also be kept containing the mug shots and fingerprints of all persons in the active files. The mechanized file, which is kept adjacent to the computer-assisted retrieval (CAR) equipment, is used for this.

"We use the CAR equipment to narrow a serach for a suspect down to five or six people," Dawes said. "All we have to do is load the magazine containing all the mug shots into the reader/printer and key in the characteristics of the suspects. The mug shots can be viewed either up in the 14 by 14-in. screen or, if there is a larger group, a bigger picture can be projected."

There is a built-in safeguard against damage to the disk memory. "At the end of each day, we transfer all new activity onto magnetic tape as a backup. The same is done at the end of each week and month.

"Even if something should happen to the disk memory, we have almost total backup. The only thing that would have to be recompiled is the day's activities," Dawes said.

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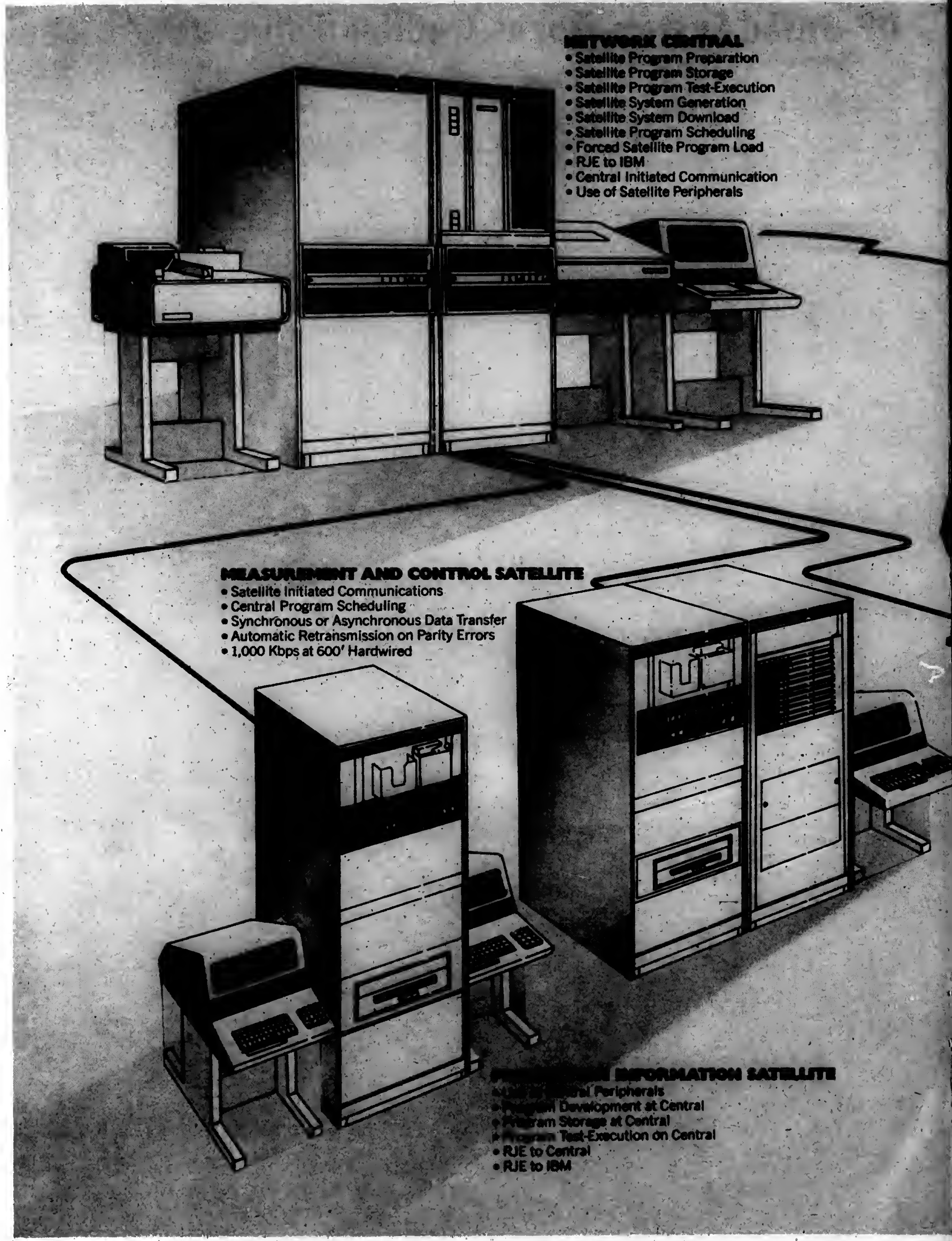

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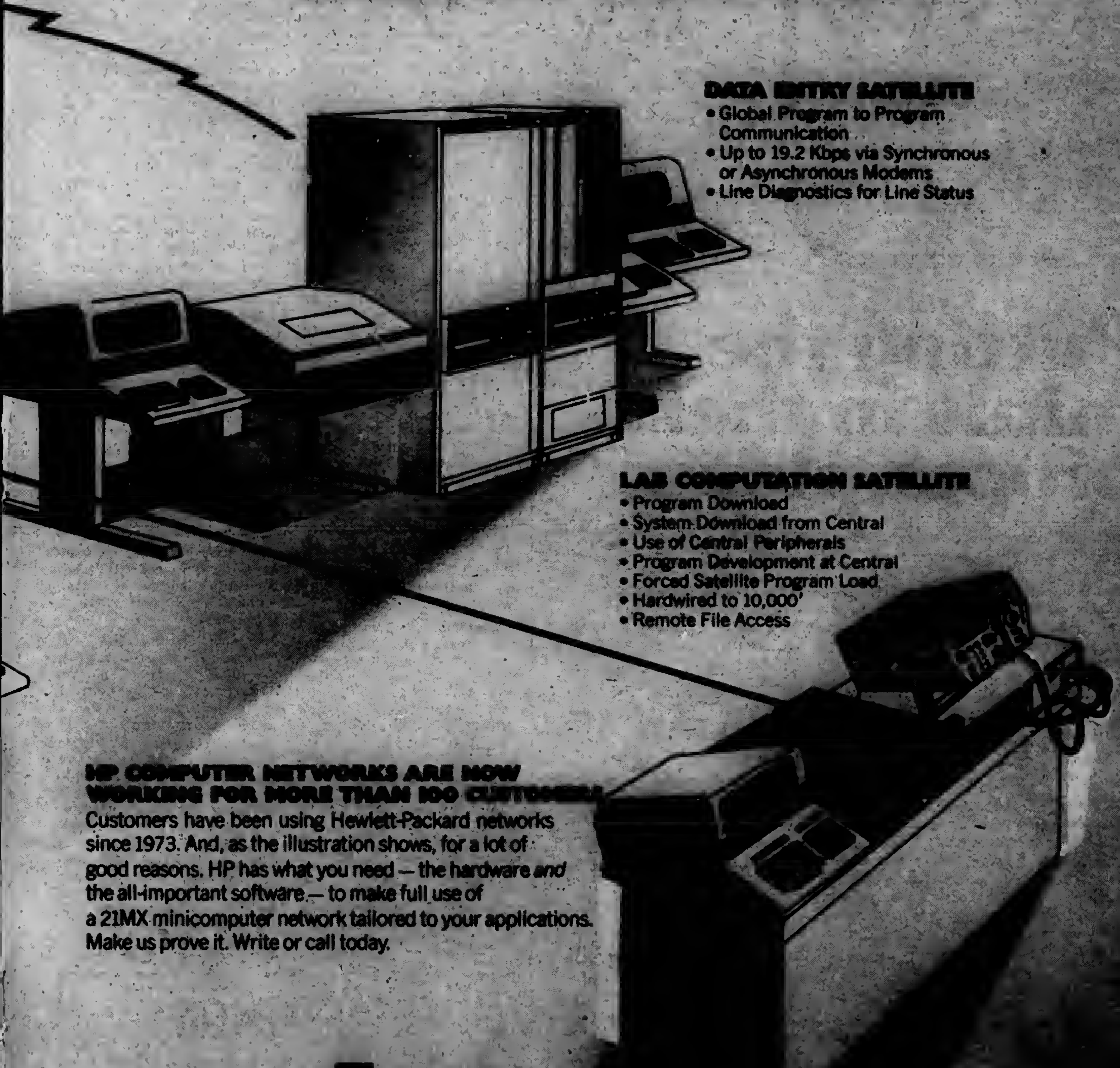

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N.Y. Social Services System Predicted To Save $300 Million in First Year

By John P. Hebert
Of the CW Staff

ALBANY, N.Y. – The state of New York is making what the commissioner of social services feels is a safe bet in implementing a welfare and Medicaid management information system.

It is waiting for executive approval of state funding appropriations of about $3.5 million for computer-based welfare management and Medicaid management information systems.

The state funds should be matched by the Federal government, making an $11 million-plus grand total available to clean up the state's mammoth social service payment system, according to Philip Toia, head of the Department of Social Services.

The systems should prove to be instrumental in turning the tide on widespread welfare payment inefficiency, abuse and fraud to the tune of about $1 million/day in savings during the first year of operation, Toia said.

Sworn in as social service commissioner early last month, Toia said recently he is confident Gov. Hugh Carey will give the go-ahead on bills passed by the state legislature appropriating the necessary funding that will clear the way for a centralized computer and telecommunications system serving CRT terminals to be located in each of the state's 58 counties.

Based on management reports of how the system will turn out, it should help save the state in the vicinity of $300 million in the first year of operation because of reduced payouts to welfare recipients, Toia said.

"It will be cost-effective even at the most pessimistic effort," he predicted, saying even a small percentage of savings of the total $5 billion annual program will yield impressive figures.

At present, "we don't have systems to track people through the social service system," – to follow up on abuses, Toia said.

The state will build edits into the system on the Medicaid side to control instances of fraud, especially in New York City, where its scope is much larger than the rest of the state in dollar amounts, but smaller in terms of the number of fraud cases, he noted.

The pieces of the $11 million pie will go substantially for computer hardware, including centrally located mainframes and CRT terminals in social service offices of each state county and for a telecommunications system to tie them to a central site, Toia said.

Extensive Planning

Extensive planning has resulted in a proposed welfare management system with a central eligibility file, which will be implemented in upstate New York first, he said.

A second portion of the total system will initially provide New York City – and the remainder of the state thereafter – with a Medicaid management information system (MMIS)

Hopes are the city will begin paying bills with the system in the next 15 to 18 months, according to Toia.

Much of the money appropriated will be used to convert the state's existing largely manual system; another portion will support an additional 200-person staff to run the system at both the state and county levels; and some of the money will be used to pick up some of the county costs associated with administering the programs, he said.

"New York is the only large industrial state in the nation without a centralized [social services] payment system," Toia said.

Because of this, the depth and scope of inefficiency and fraud is seemingly enough to justify implementing a computerized payments system.

Inefficiency is most easily seen in duplicate payments, which occur when a health care provider is not paid soon enough for his services and sends another bill a month later which, if left unpaid, will result in the sending of another bill, Toia said.

At about the third month, "efficiency overcomes good sense" at the social services payment office, which then pays the doctor for all three bills.

And, in the realm of fraud, Toia said the two "Medicaid mills" – representing white-collar crime at its most colorful (in terminology), yet equally as disastrous to the welfare budget – are the practices of "ping-ponging" and "family ganging."

The new system, with its various built-in edits, should prevent doctors' practices of ping-ponging patients from doctor to doctor when there is no need to do so by tracking the over-utilization of care and patterns of abuse by certain health care providers, he said.

The state has drawn up a request for proposal (RFP) for competitive bids on the system, which is "just about ready to go," Toia said.

Because New York has "learned from the experiences of the other big states," he predicted it will have the best system in the nation by the time it is done in four or five years.

Part of this planning included going outside the confines of government for key personnel to give the system a mix of public and private experience behind it.

"I need the innovators now and I'll get the implementors later," he said. Toia has received 400 responses from ads in the *New York Times* and *Washington Post* for job positions, and 15% of the responses were from top-notch people."

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Putting the minis in their proper places.

Read *Minicomputers and Small Business Systems* in the August 30th *Computerworld.*

The minicomputer market is bullish and booming. Minicomputer shipments will reach approximately $1.3 billion in the U.S. this year -- nearly triple the value of units shipped in 1973 (Source: International Data Corporation, the world's largest EDP market research firm). The fundamental reason for this rapid growth is the mini's declining cost, which has given rise to a wider and wider variety of uses for these versatile machines. Once a creature of the laboratory and scientific environment, minis can now be found doing everything from on-line network control to functioning as CPU's for complete small business systems (many of which are found in very large businesses, as the idea of distributed data processing begins to take hold).

In our August 30th supplement, edited by Esther Surden, we'll be taking an in-depth look at minicomputers and small business systems. Using application stories and tutorials, we'll examine how minicomputers function in distributed processing environments. We'll also have a survey of distributed processing: who uses it, what it is, and where it's headed. We'll analyze current trends in minicomputer development and discuss what the "superminis" have to offer. We'll also present a variety of stories on small business and turnkey systems. We'll examine the different types of systems available, the hardware and software features they offer, and look at how costs compare with benefits for some first-time users converting to a small business system.

Whether you're a giant professional computer site, or one of the smallest first-time users, this report will have important information for you. It's in the August 30th *Computerworld*. If you're a minicomputer manufacturer, a systems house specializing in minicomputer enhancements, or a small business system vendor, you should advertise here. Contact your *Computerworld* salesman to reserve your space. Or call Judy Milford at (617) 965-5800.

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'Why' Questions Key to Discovering Reserve Capacity

By Edward A. Olmstead
Special to Computerworld

Most data centers – even when fully loaded – have a large reserve capacity.

The reserve capacity may not be obvious. It may not even be measurable by any of the computer performance measurement tools – but it is there nonetheless. There is a simple key to finding that reserve capacity and putting it to use.

The same simple key may give a current system added life before a hardware upgrade, give a user access to the capacity he needs for critical development work and allow him to reduce the use of outside services or even reduce the hardware budget.

The key to finding and using the reserve computer capacity is not found in hardware or software monitors.

The key that must be used consists of three simple letters – W-H-Y.

"Why" is best used to start a sentence in the nature of: "why does that; why doesn't that; why do we pay for; why can't we?"

Sample Uses of "Why . . ."

Here are some samples of the 'Why?' method:

- Why should an IBM 370/145 have 128K of memory added to teleprocessing?

The answer is that it should not. But there is a problem on the tape channel and the applications need adjustments.

This answer required two months and a computer hardware monitoring study. But the core still has not been added after three years; the system performance improved; and the DP manager knows what his real limiting factors are now.

- Why should this application justify having two drum units when there are no other users for the drums?

The answer is there is no need; it's just always been run that way because the designers thought drums would be needed.

Parallel tests did show an extension of run time of 4%. But that is a small price considering the savings of $75,000/year for the past five years since the drums were shipped back to the vendor.

- Why are we paying for these software products?

Well, it seemed someone once thought they would be nice to have around just in case we wanted them . . . but that was three years, and $18,000, ago and they have not been used yet.

An Old-Fashioned Attitude

Granny used to say ". . . use it up, wear it out, make it do or do without."

That is pretty hard-core stuff today, not the kind of thinking you will hear from your friendly computer vendor on his next sales call.

This is not an attitude for all times since there have been a few significant improvements in the machines. But you can get a lot more utility out of your current computer for day-to-day work. Just don't be the owner of the last IBM 704; next to last maybe, but not the last one.

Bascially, the organization pays someone a lot of money for the computer. It is the user's job to make certain the money is well spent.

That means the user does not stand still for a lot of expensive frills (now called overhead or systems functions) unless there is a good reason for having them around. Nor does he ever accept "We have always done things this way" as a final answer, even if some people feel threatened by the questions.

Now then, once a user has cleaned up his act and developed a reputation as a "Super Scrooge" who asks some pretty tough questions, what next?

When a user has done all that, he can find and use the reserve capacity of the computer center with the tools at hand. He should then take the next step – ask "Why should I use . . . a hardware monitor? A software monitor? A simulation system?"

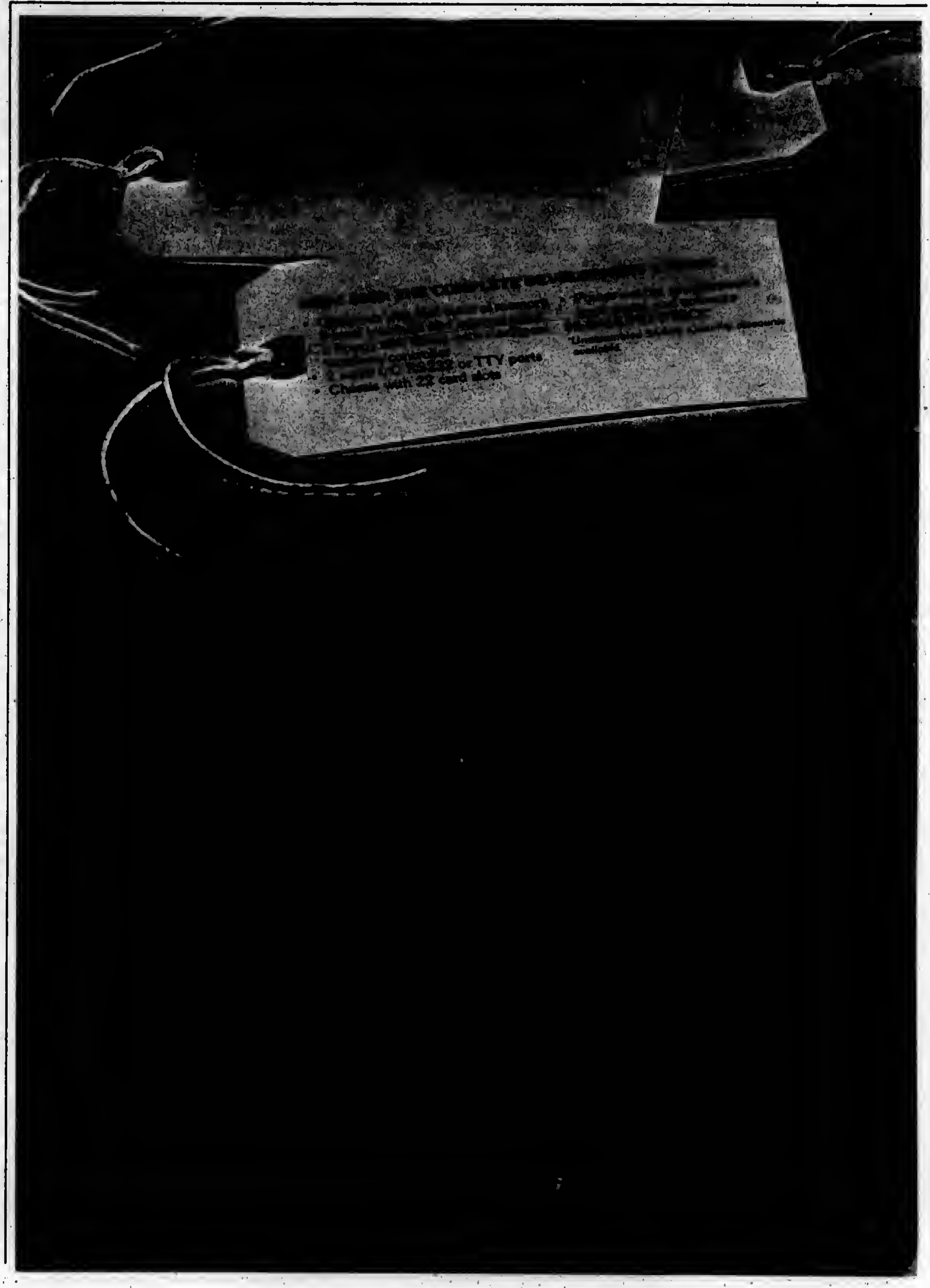
This means the user will have to know what the questions are he cannot answer using the tools at hand, and he needs to make intelligent guesses as to how much benefit he will get from those answers.

Then he should set up a plan for measurement of his reserve capacity. And put that plan through the same tough test of "why" that he used on the computer.

When he has gone through the process of finding and using the real reserve capacity of the computer system, he will see that:

- Equipment upgrade can probably be delayed.
- Some of the "essential" parts of the hardware are really excess.
- The programmers and analysts now design for performance.
- The user community sees him in a new light.
- The next DP budget will be easier to get approved.
- And last, but not least, he will know he is doing the best job he can do with the resources he is managing for his organization.

Olmstead is a consultant with Compass Management Group in Bellevue, Wash.



Mini Bits

IEEE Seminar to Discuss Micro Design, Applications

PISCATAWAY, N.J. – A five-day course in microcomputer design and applications with "hands-on" experience will be offered by the Institute of Electrical and Electronics Engineers (IEEE) Sept. 27 through Oct. 1.

The sessions will be held in Atlanta, Ga.

The course is intended for active design, applications and manufacturing engineers, who are well versed in the development of digital electronics at the chip interface level, IEEE said.

It should bring the experienced engineer up-to-date in the architecture, programming, systems design, applications and marketing economics of microprocessor technology through lectures and unique laboratory projects using an 8-bit microcomputer, the organization said.

The registration fees are $300 for IEEE members, $100 for IEEE student members and $375 for nonmembers. Information is available from the educational registrar at IEEE at 445 Hoes Lane, Piscataway, N.J. 08854.

Tycom Gives Hard Copy for 5100

FAIRFIELD, N.J. – The Tycom Systems Corp. 5100 provides IBM 5100 users with hard-copy output, upper/lower case characters and up to 156 character-print positions, the firm said.

The unit interfaces to the IBM Selectric II and provides letter-quality printout for final reports and presentations, Tycom said.

Typical applications include word processing, accounting and billing, payroll, manuals, contracts and proposals, the firm said.

The Tycom 5100 costs $2,495 without the Selectric from the firm at 26 Just Road, Fairfield, N.J. 07006.

Infotek Adds Floppy Disk

COVINA, Calif. – Infotek Systems has introduced a floppy disk for the Hewlett-Packard (HP) 9830A scientific calculator.

Called the FD-30, Infotek's floppy disk emulates the 9830 cassette system so no changes in existing software are required, the firm said. The cassette control commands and syntax of the 9830 are obeyed and all such programs operate without modification, a spokesman noted.

The unit is 4 in. high and fits between the calculator and printer, he added.

The FD-30 floppy disk costs $3,895 from Infotek Systems at 733 East Edna Place, Covina, Calif. 91723.

Overtime Drops $30,000/Year

Baking Company Saves Dough With Mini

By Esther Surden
Of the CW Staff

SAN DIEGO – A wholesale bakery here has successfully converted from an IBM 3 to a Digital Equipment Corp. Datasystem 500 and is realizing a $30,000/year savings in overtime costs, the user said.

The company, Town Talk Baking, had been using the 3 for about three years before it "occurred to us it might not have the best system for the money," according to Jim Smith, the firm's DP manager.

When management felt consideration must be given to on-line time-sharing systems because it no longer wanted to be "locked into a batch-oriented environment," Town Talk looked at systems from Martin Wolfe, Microdata Corp., Basic Four Corp. and DEC.

The firm chose the DEC system because "the price/performance ratio was very attractive" Smith said. The system could also perform multiple jobs simultaneously and allow the DP department to expand its applications.

The configuration chosen by Town Talk has been expanded since its selection a year ago. It now includes a PDP-11/40 processor with 160K of core memory, two cartridge disk drives and 20M bytes of additional disk, three CRTs, two Decwriters and a 16-port multiplexer.

The total hardware investment was about $130,000, according to Smith.

Rewrote Programs

It took Smith about six months to convert from the 3, rewriting the programs to suit the new equipment, he said. The two systems ran in parallel for several months before the DEC system was ready to go it alone, he added.

The programs written by Smith are designed for a bakery's particular operating methods.

Salesmen receive computer printouts daily based on route sales for the same day of the week before. If the salesman makes no changes, the order is repeated for the new week.

Orders can be altered up to 9 a.m. on production day; all changes called in by salesmen are entered directly into the system via the CRTs.

The system adds all order quantities in each product code, translates quantities into dough weight and relates the codes to 20 dough formulas stored on disk.

The mini also figures the total batch weight of each type of dough needed for the day's orders, and final bake orders are ready within 15 minutes.

After transmitting the final bake order,

(Continued on Page 32)

General Contractor Uses CPU To Improve Cost Estimating

KINGSPORT, Tenn. – A general contractor here is using a small business system to improve its cost-estimating procedures.

The IBM System 32 was installed at Rentenbach and Wright, Inc. last August. Rentenbach and Wright operates in a four-state area, designing and erecting a range of industrial and commercial buildings.

Before going with IBM, the firm looked at systems from NCR and Burroughs, according to Frank Brewer, the company's president. IBM was chosen because "we felt it had the best programming and best support for the system, both maintenance and software," he said.

The configuration includes the System 32 with 9.1M bytes of disk and a 100 line/min printer. It is being leased for about $1,400/mo, Brewer said.

"The system has enabled us to effectively manage an enormous increase in business without increasing management personnel," he said.

"And, he added, "it has assisted in building our clients' confidence in how we handle their business."

Most of the firm's business comes from negotiated contracts rather than bidding situations, Brewer pointed out. "We believe the detail and accuracy of our computerized cost-estimating program helps build credibility with our customers because we can deal in actual figures," he said.

Special Concrete Program

A unique concrete estimating program written under contract by IBM allows the estimator to feed certain variables about a job into the computer.

"The price of concrete may vary from $24 to $40 per cubic yard depending on the location," Brewer noted.

Using this input along with job cost data stored in the system, the mini calculates the size of the footing, excavating requirements, materials costs and labor costs for the job.

"Instead of a single cost item for concrete, we get detailed costs of the slab, walls, sidewalks, steel mesh and even backfill," Brewer said. "When a customer

(Continued on Page 31)

Lockheed Has Three Systems For Small Business Users

Lockheed System II

LOS ANGELES – A programmable small business system, a turnkey general-purpose system and a minicomputer dedicated to insurance agency and brokerage accounting were introduced by Lockheed Electronics Co., Inc.'s Data Products Division.

The Lockheed System II is a desk-sized system including the firm's System User Engineered (SUE) CPU, 5M bytes of disk, a 1,920-char. CRT, keyboard, printer and software.

Two versions of the System II are available, Lockheed said. Model 1 is a turnkey system with 16K of memory dedicated to payroll, taxes, accounts payable and receivable, purchase and order entry, inventory and general ledger applications. Model 2 is a user-programmable system with 32K bytes of memory.

The Servus 80 is the System II with a package to allow a broker or agent to prepare premium notices, monthly statements, client policy/ledger inquiries, accounts and commission statements, sales analysis, expiration listings and aged receivable trial balances, the firm said.

The turnkey system with 16K of memory costs $21,950; Model 2, with 32K of memory, costs $26,075. Models of the Servus 80 cost the same as the models I and 2, the firm noted.

Lockheed is at 6201 East Randolph St., Los Angeles, Calif. 90040.

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Growth Convinces Photo Equipment Firm to Buy Mini

CARLSTADT, N.J. – A photographic equipment distributor here is pleased with a small business system's ability to handle his firm's growth.

Argraph Corp. purchased a small system in 1973 after growth made the firm a $5 million/year earner, according to John J. Roth, president.

Originally the company's billing was handled by an accounting machine with all additional functions done by hand.

After purchasing a Basic/Four Corp. small business computer in October 1973, the firm automated its handling of order entry, invoicing, inventory control, accounts receivable and cash receipts.

It then expanded the system to incorporate general ledger.

Growth prodded Argraph into purchasing a minicomputer. Management felt the need for more information and on a more timely basis.

"We hired a qualified computer consultant to research the field for us and decided on the system for several reasons. We were able to continue our existing operations in the format most familiar to our employees. The system was able to expand into other information reports. And we could do this without complicated programming requirements,"

The system consists of a Model 400 central processor with 32K bytes of core memory, a disk drive with 4.2M bytes of storage, two CRTs and a medium-speed printer.

More Reports Feasible

The warehouseman, Pat Petrocelli got involved in programming, making changes and writing new reports which previously hadn't been available.

A major benefit of the computerized system has been its ability to generate new, useful reports which weren't feasible with a manual operation, he said.

"We are constantly expanding our applications to provide us with information basic to our marketing activities," Roth explained. "We began with simple order entry, invoicing, inventory control of some 3,000 items at three locations, accounts receivable and cash receipts.

"We then expanded these applications for the adjunct programs, including sales reports by salesmen, territory and customer. From the order entry system we developed a packers report which keeps us informed on the productivity of the shipping department. Afterwards, all this data is expanded to provide salesmen's commission reports."

Quite apart from its marketing operations, Argraph has found the minicomputer useful in overall business activities. General ledger, previously done manually, is being handled by the system and takes about 10 days less than before.

Diskette Memory Fits LSI-11

BERKELEY, Calif. – The DSD 210 diskette memory system from Data Systems Design is a Digital Equipment Corp. LSI-11-compatible floppy disk system, according to the vendor.

The unit is IBM 3740 format-compatible; diskette formatting and write protect are standard features, it noted.

Data transfers, data error checks and read/write head positioning are controlled by an 8-bit microprocessor.

The DSD 210 costs $2,795 from Data Systems Design at 1122 University Ave., Berkeley, Calif. 94702.

Contractor's CPU Improves Estimates

(Continued from Page 30)

sees this kind of detail, he knows we're not guessing at the cost of a project.

"The computer can estimate the cost of the project in about 30 seconds, while we used to take two to three hours to do the same job manually. We can get cost figures on up to 150 separate items in the major category of concrete work alone.

"That kind of detail allows us to carefully adjust unit prices as items change and helps us manage a project for profitability. We can tell when a segment of the job is running into trouble before it is too late to correct it.

"It gives our field force a vital management tool," he concluded.

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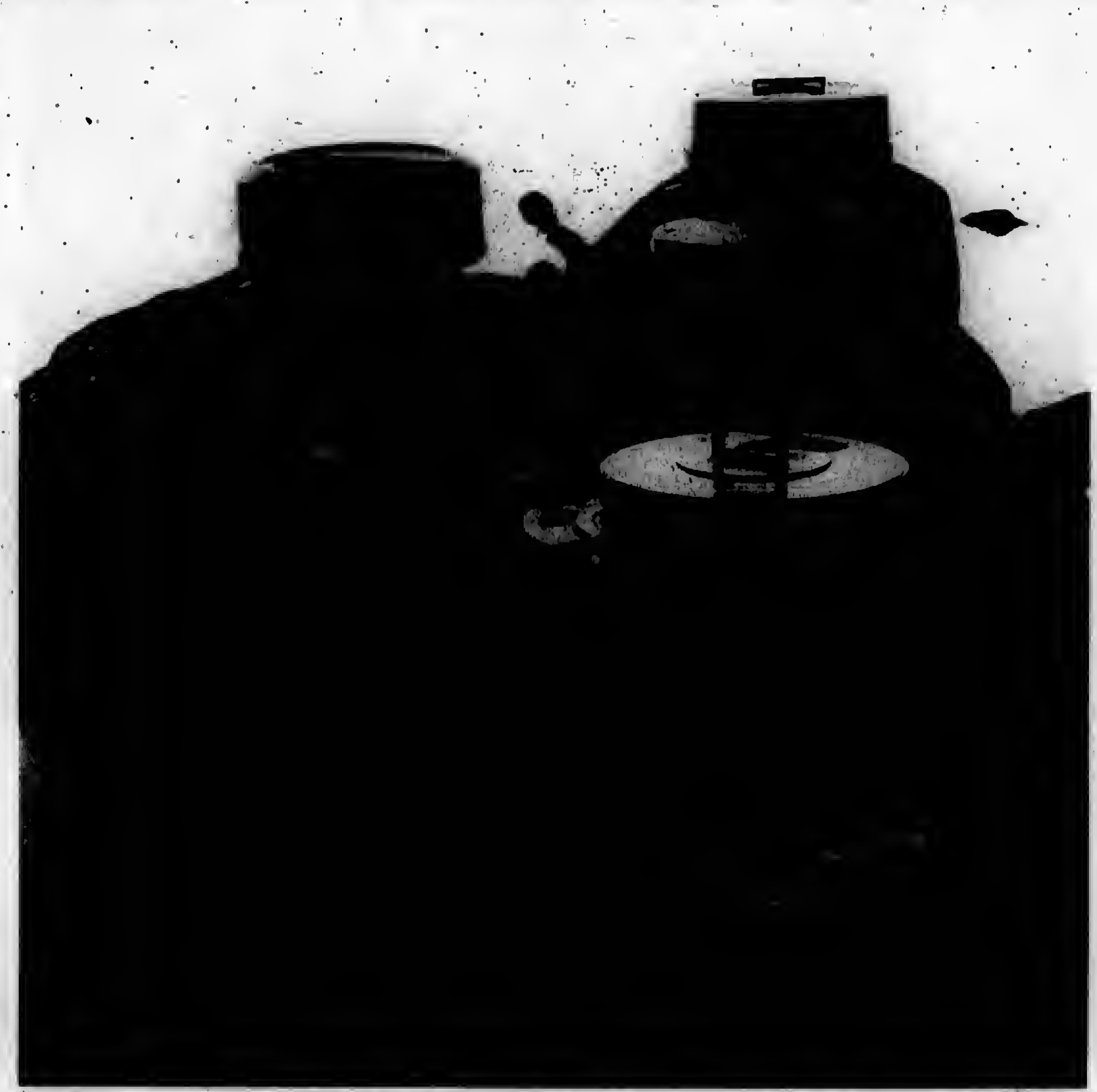

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Micro Kits Seen Spurring Interest in DP as Hobby

By Toni Wiseman

Of the CW Staff

NEW YORK – "Microcomputer kits have changed the build-it-yourself hobby dramatically," Stephen B. Gray, president of the Amateur Computer Society, said here recently.

Until the introduction of such kits some two years ago, only about two dozen amateur computers of any real complexity were in operation, nearly all of which had been built from scratch by engineers in the computer industry, Gray said.

A show of hands among the attendees at the National Computer Conference (NCC) session revealed he was addressing some 25 to 30 who had personal computers operating in their homes, however.

And, while there were only two dozen "hobby" systems operating two years ago, today there are two dozen different microcomputer kits available, based on a half dozen different microprocessors, Gray said. Some 7,000 of these kits have already been sold, he noted.

Micro kits may be popular, Gray said, but many computer hobbyista are still building machines to their own design or copying a commercial machine or operating and/or rebuilding obsolete computers.

Formidable Drawbacks

"Vacuum-tube computers are occasionally available, but moat of the drawbacks in using them are formidable: many are so large a barn is required to store them; they need a great deal of air conditioning and electrical power, and tubes can be expensive to replace," he noted.

To get these computers working, schematics are essential, and they are almost never available, he said. This leaves the hobbyist with two options: to take months or years to trace out every connection or to rewire most or all of the machine.

Despite all the problems, many computer enthusiasts are still operating an old computer or trying to get one into shape, Gray said.

Other hobbyists are building their computers from scratch, eschewing kits or ready-made machines.

The problem in building a computer from scratch without resorting to a microprocessor is that so many areas of specialization are involved, he said, ranging from logic, input/output, memory and peripherals to mechanical skilla such as packaging, back-panel wiring, metal working and many others, he said.

While starting from scratch does not pose great problems for an engineer, for the beginner the problems of designing a circuit or connecting the various portions of the computer can be real obstacles, he said.

"Even supposing an amateur computer builder did get hold of complete schematics and all the parts, the one big stumbling block that has thrown many is core memory," Gray said.

"It is still expensive to buy when new, and when surplus it may contain broken cores, or perhaps it'a surplus because it couldn't pass the manufacturer's quality control.

"Getting a core memory to work atill separates the men from the boya, if there are still any who want to try it, now that semiconductor memory is so readily available and so cheap," he said.

Gray cited several examples of computer engineers who had designed their own machines, such as one who had assembled a preintegrated circuit machine which took him a year to build and which he expects to spend 10 years programming.

Amateurs wanting to make things easier for themselves by copying have two choices, according to Gray. The can either obtain the schematics of their favorite machine and try to duplicate it or they can build a machine of their own design that will use the instruction set of a commercial machine, such as the Digital Equipment Corp. PDP-8.

Book Guides Users Through Micro Arena

ORANGE, N.J. – D.A.T.A., Inc.'s Microcomputer D.A.T.A. Book is said to tell the user everything he wanted to know about the microcomputer arena but was afraid to ask.

Included in this 260-page reference guide is information about 100 microcomputers, 100 microprocessors and 1,000 related memory and I/O devices, according to D.A.T.A.

Users can find the electrical characteristics, software support and instruction set information for the micros by knowing the system, microprocessor, memory or interface type number, the company said. The user can tell the level of involvement of a particular manufacturer in the microcomputer industry by consulting a special table, the company noted.

General terms and definitions relating to micros and addresses of all the indexed manufacturers are included in the book. D.A.T.A. is located at 32 Lincoln Ave., Orange, N.J. 07050.

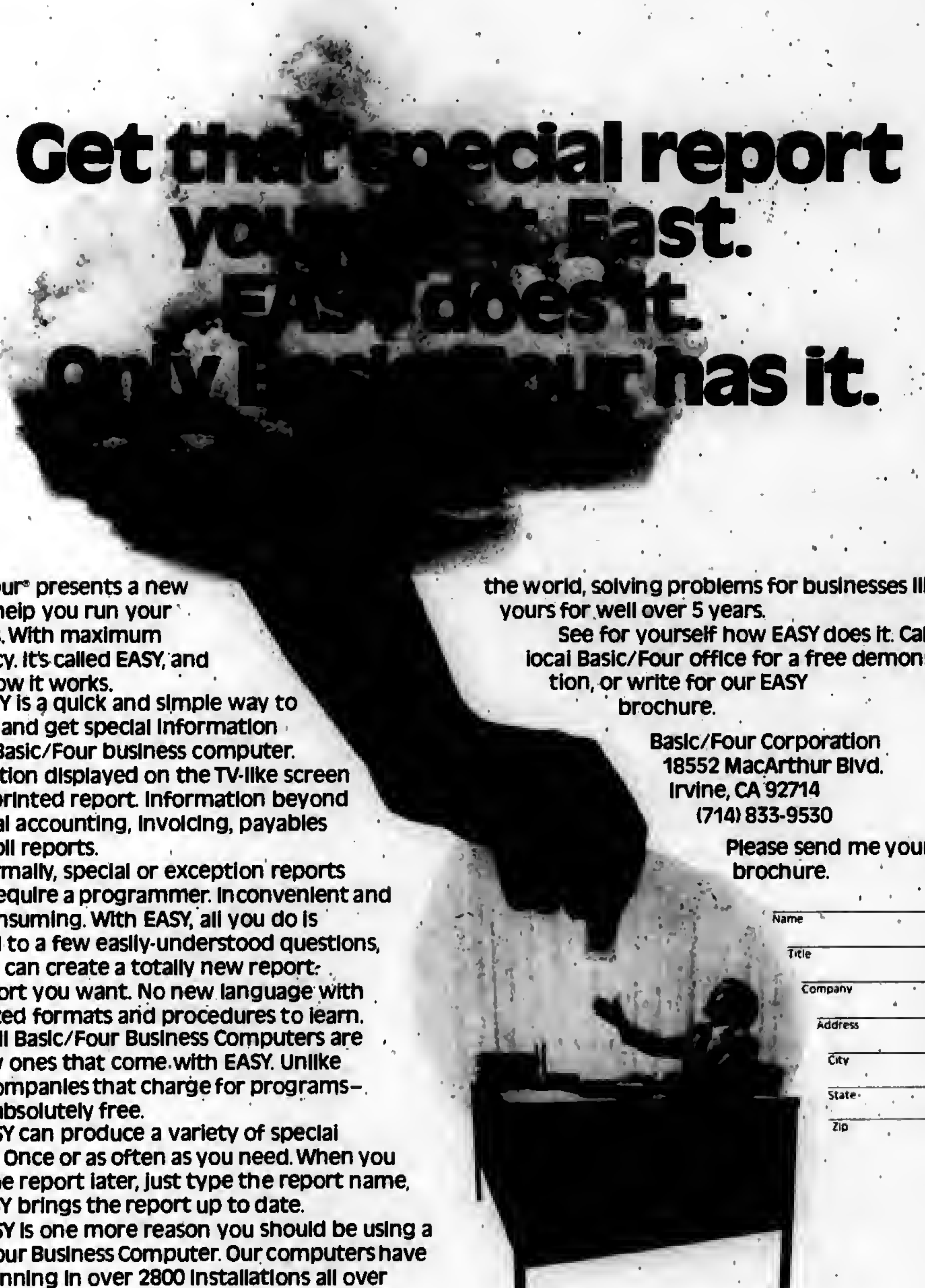
Baking Firm Saves Dough by Using Mini

(Continued from Page 30)

the mini reprocesses the information and prints a load sheet for each route. The sheet details loading quantities, dollar values for each product category, total load value (for the salesman) and leaves space for the loader to make adjustments. Route loads are recapped by the distribution center before transports which supply four delivery depots, are loaded.

Load adjustments and salesmen's stale return figures are entered into the computer on a second video terminal. The system converts the data into dollars and cents, processes those figures against the load value and prints out a settlement sheet that tallies the amount the salesman owes.

An offshoot of the daily bake order is generation of analytical repots to assist management in sales and production. The system provides the production department with a daily dough report, compares actual production with distribution and indicates discrepancies, helps control the flour inventory and accuracy of dough scaling. Also detailed are route sales by area, sales to naval ships and shore stations and to other wholesale bakeries.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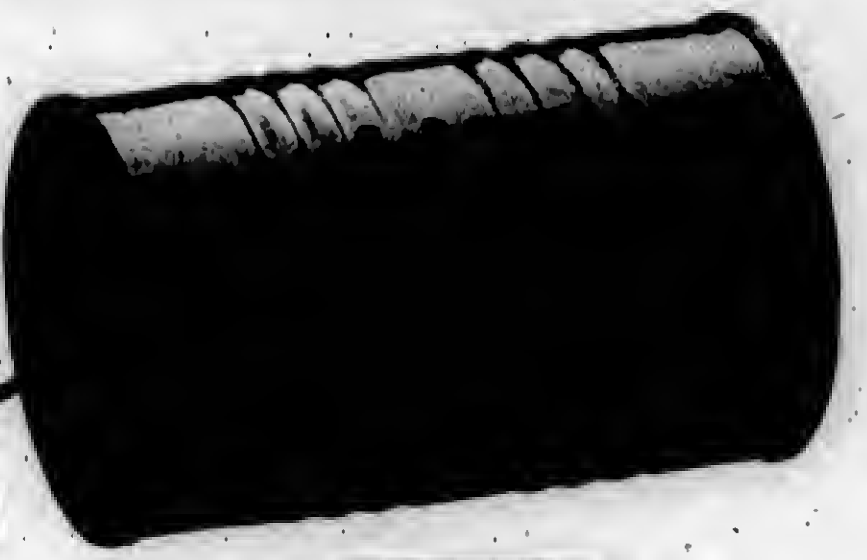

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Although Vendors Unclear About Limits

Lower Costs, Flexibility Seen Advantages of Single Bus

By Molly Upton

Of the CW Staff

The search for flexible, inexpensive machines has led an increasing number of manufacturers to adopt single-bus architecture, interviews with a number of vendors recently found:

Although there are distinct advantages which were universally extdlled by those surveyed, the disadvantages and limitations are less clear.

Some concede there are throughput limitations inherent in such a design; others maintained there are means of extending the capabilities of a single-bus design.

Digital Equipment Corp. pioneered the single-bus concept with the Omnibus on its PDP-8/E and then later inaugurated the Unibus on the PDP-11 series.

Honeywell Information Systems (HIS) last winter came out with the Level 6 series of minis and NCR Corp. and Harris Corp. more recently introduced the Criterion and Slash 6 respectively, all of which also use single-bus architecture.

While all of the product managers or engineers of these firms praised the single-bus concept for its modularity, flexibility and cost effectiveness, they were not as consistent in enumerating the design's limitations.

All indicated the concept of a single bus, in which slots can accommodate either I/O or memory devices, will continue to be in use even if a system expands to the point where separate buses are necessary.

The most important advantages of using a single bus are inexpensive mechanical and electrical packaging and cable length, according to Tom Orr, senior engineer at DEC.

Small packaging is made possible by use of minimal amounts of wiring, cable and electronics to send and receive signals, he said.

Economics Favor Concept

Michael Simon, manager of hardware planning for HIS' Boston computer operations, explained the economic aspects.

Four or five years ago, the single-bus design was not as cost-effective as it is today, he said, because circuit costs were high. The single bus has a higher circuit cost per port because every slot can be either memory or peripherals, he said.

"So there are more circuits per interface. But the circuit costs are so small now and the flexibility gained is so much more valuable, HIS chose to go that way.

"The HIS 716 and older minis used two buses because the circuit costs were far more important then," he observed.

"The single-bus design gives a broad capability to design for various applications with the fewest number of building blocks," Simon said.

"It's really a question of satisfying as many people as possible with a single bus, and then when you get to high performance, where the cost can be justified, you use the single bus as the right-hand one and add the memory bus on the other side," he said.

Biggest Drawback

But the biggest drawback to a single bus is that it cannot be used on very high-speed or very powerful CPUs, DEC's Orr said.

In a radial bus structure, where every device has its own cable, there is no throughput problem since the machine is not bandwidth-limited, he explained.

However, in single-bus architecture, everything is on the same piece of wire and this means taking turns. So the CPU has to arbitrate whose turn it is to use the bus, he said.

"The drawbacks are that you are throughput- and bandwidth-limited because everything has to take its turn, plus the sophisticated logic needed to control mastership of the bus," Orr added.

It is a "seat-of-the-pants" decision as to when the bus will be overloaded, he noted.

"You design something and all of a sudden you decide, 'Gee, that thing's running terribly slow.'

"You get to a point where you design so much power into a CPU that you can't take advantage of it because the bus won't allow it to go fast enough to the point where you designed it," Orr said. "That's when you add extra buses."

The larger PDP-11/45s and the PDP-11/70s incorporate specialized memory and mass storage buses in addition to the Unibus;

(Continued on Page 36)

Suit Charges IBM 'Slander' Caused Demise of Firm

By Molly Upton

Of the CW Staff

LAS VEGAS – Slander. That's essentially one of the charges filed against IBM in a $25.5 million amended suit brought by a defunct service bureau, Royal Data, Inc.

The suit, filed in federal district court here, alleged IBM employees spread the word Royal Data was linked with the Mafia and it was therefore driven out of business.

The suit charges business defamation as well as trespassing and unfair competition.

More than 1,000 pages of pretrial depositions include descriptions of Royal Data's attempts to sell its services, only to be rejected since word has it the firm's connections were nefarious, according to the *Wall Street Journal*. The depositors have been sealed, as is that court's custom.

"The law suit stems from IBM's repossession in February of 1973 of equipment leased to Royal Data, but on which Royal Data had not paid rent for five months," an IBM spokesman said.

"Royal Data reacted to that repossession by immediately filing suit alleging IBM had unlawfully trespassed and had damaged Royal Data's system by throwing an emergency power switch," he said.

"It was not until two years later that Royal Data amended ita complaint to allege defamation by IBM employees. Like the trespass claim, that charge is totally without merit and we are confident that IBM will prevail on both," the spokesman said.

IBM has countersued Royal Data for $48,000 it claims the firm owes it.

Founded as Casino Service

Royal Data, founded by John Perazzo Jr. of New York, was established in 1971 to provide a computer credit-checking service for Las Vegas casinos as well as billing, payroll and profitability analyses.

Of the firm's initial $275,000 capitalization, $175,000 came from Perazzo's father and $100,000 from a long-time associate, according to the *Wall Street Journal* account.

IBM at that time was in the service bureau business through its subsidiary, Service Bureau Corp., which was acquired by Control Data Corp. in 1973.

Royal Data was active for seven months, accumulating revenues of $36,000.

Royal initially leased a 360/40 from IBM, Perazzo said, because he had the "highest regard" for the firm and its service from his experience in New York.

The firm experienced "a conglomeration of problems" with IBM which, he said, had been trying to enlist casinos as customers. Perazzo felt it was "fruitless to stay with IBM."

On Aug. 30, Royal cancelled the 360/40 from IBM and from September to November changed over to a 360/40 leased from Boothe Computer, Inc., he said. Royal Data also tried to procure service from a third party.

IBMera Turned Off Power

Along with the Boothe CPU came Courier terminals because IBM at the last minute notified him there would be a two-month delay in delivery of the CRTs he had ordered, Perazzo said.

The principal piece of IBM gear on the premises when about 10 IBMers entered the DP center and threw the emergency switch while the system was up and on-line was a 2701, from which they pulled some cards, Perazzo said.

Royal was unable to get the system back up, and closed its doors, he said.

IBM refused to bring the system up unless Royal either paid it the $48,000 it claimed in back rent or took out the 2701, he said. Perazzo tried all over the country to get another 2701, but needed it within the 120-day delivery schedule quoted, he said.

Later, an IBM attorney wrote saying IBM would bring the system up, but by then it was "too late," he said, adding Las Vegas is like a small town and word was all around that Royal's system wasn't operating.

Perazzo also has his views on the $48,000 IBM is claiming. Royal offered to pay what it thought it owed, about $12,000 or $14,000, but IBM would not accept that, he said.

To begin with, the initial 360/40 installed by IBM took 17 days to bring up, which Perazzo said should have taken three or four days. The system then would "constantly go down," he said.

In addifion, Royal had ordered it with a floating-point feature, which wasn't on the delivered system. All Royal's software had been written in advance for a system with a floating point, and "therefore we could not begin to test our software," he said.

Rumors About Mafia

The rumors about Royal's connection with the Mafia were circulating even before Royal opened its doors, he said. Central Telephone Co., which was going to provide Royal with time to test programs on its IBM machine in accordance with an arrangement with IBM, refused to let Royal do so, he said.

Perazzo is still in Las Vegas and involved in a DP-related business after "shaking the monkey off [his] back" by filing suit against IBM.

Among the depositions, the *Journal* said, is one from an IBM staffer who acknowledged he had heard IBMers talk disparagingly about Royal Data, but only within the IBM office.

The service envisioned by Royal Data would have con-

(Continued on Page 36)

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Cost, Flexibility Cited as Advantages of Single Bus

(Continued from Page 35)

he said.

"If you took all that memory and disk and drum memory and dumped it on the bus, the CPU wouldn't have any time to do anything on the Unibus," he explained.

Small computers are very much at home with a single-bus structure because by design they don't have the power to overcome a single bus, he added.

"When you get to the big systems that are really passing a lot of data back and forth and have many different electronic boxes communicating with them, you can only stuff so much water through a hose," Orr observed.

NCR Sees No Problem

However, Tom Carroll, manager for Criterion marketing product programs at NCR Corp., said he doesn't anticipate a problem from heavy memory traffic on the bus because of the way the models are designed.

The memory in the 85/70 model, which is two-way interleaved, can range from 256K to 1M byte. Instead of plugging the memory modules directly into the bus, NCR chose to free up more space for additional I/O devices and interfaces by plugging only the memory interface directly into the bus, he said.

The memory modules themselves plug into a separate rack, he added.

By contrast, in the smaller 85/50, the memory modules themselves go into the bus, he said.

Jim Strelchun, product manager of Harris' Slash 6, also doesn't see any throughput problems stemming from the single-bus design. The degree of conflict is a function of the sort of logic employed, he said.

The Slash 6 has "very efficient logic that controls the bus," he observed, adding the system has a 48-bit data bus where two words are transferred in parallel, contributing to a high throughput rate.

The memory consists of 16K-word modules with interfaces to the bus that have their own timing and control logic to access the bus.

In addition, each memory module has in effect a mini cache. A 48-bit buffer expedites memory access, he said, noting the maximum memory for the Slash 6 is 768K bytes.

Strelchun said he classifies the Slash 6 in the performance area of the IBM 370/145 and the Decsystem 20.

Simon said he feels the HIS Megabus will be able to handle higher performance levels than those announced.

The Megabus has 24 address bits, so it allows 8M bytes of memory to be plugged in, he said. The 6/34 and 6/36 CPUs have a maximum addressability of 64K words.

"We laid the bus out so if you want to go to the next version, which addresses more memory, you plug in a different CPU board and more memory, and it's all there," he said.

Suit Alleges IBM Put Service Firm Out of Business

(Continued from Page 35)

nected terminals in the casinos to its CPU, which would keep track of credit balances of gambling customers.

A casino that knowingly deals with organized crime can lose its license. But even without the rumors of connection with the Mafia, Royal Data might have had a hard time establishing business, according to some of the depositions as reported in the *Journal*.

One casino executive reportedly called Royal Data's prices out of line, while another indicated he had trouble determining the financial soundness of the firm.

In addition, the Perazzos were from out of town and asking for sensitive information – the names of customers who gamble on credit, according to another deposition, the *Journal* said.

The legal firm representing Royal Data is Loeb & Loeb in Los Angeles, which also represents Keronix, Inc. in its suit against Data General in which it has charged the larger mini maker with conspiracy to commit arson and to wiretap Keronix's phones [CW, Jan. 22, 1975].

International T/S Net Proceeding Well: CSC

LONDON – Computer Sciences Corp.'s (CSC) multinational service company is coming along very well, according to John Luke, president of Infonet, CSC's time-sharing network.

Infonet is currently operating in Europe via a remote concentrator in Brussels and land links to London, Paris and Frankfurt.

The centers are linked to Univac 1108s in Chicago.

A parallel operation is underway in Spain. Under a licensing agreement, CSC is leasing its Infonet software to Entel Ibramatica, a subsidiary of the Spanish Telephone Co.

The service is currently offered on a CSC computer via satellite.

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Because of Limits on DP Imports

Burroughs' Brazilian Subsidiary Starts OEM Program

By Donald M. Best

Special to Computerworld

RIO DE JANEIRO, Brazil – Burroughs Corp.'s Brazilian subsidiary, Burroughs Eletronica, will offer its entire line of peripherals to other suppliers here on an OEM basis.

The announcement, made by Burroughs chairman Ray W. McDonald during a recent visit, was seen by many members of the DP community as a measure which could help alleviate the bottleneck many companies now face in importing such equipment.

Henry V. Eicher, president of Burroughs in Brazil, said the OEM program will give other suppliers here the option of marketing Brazilian-made peripherals rather than pursuing the very long and costly process of importing their own lines of equipment.

Balance of trade problems have prompted the Brazilian government to institute a number of import restrictions in the DP sector, forcing many companies to curtail marketing activities because of the lack of equipment.

"We find ourselves in the very unique and somewhat painful situation of having clients at the door and no equipment in the warehouse to sell," one marketing manager said.

International News

With regard to the offer from Burroughs, Eicher explained "this difficult situation we face now can be remedied somewhat if those companies which do manufacture here will, like Burroughs, offer their equipment to other suppliers on an OEM basis.

"As far as we are concerned, it's a two-way street. Burroughs Eletronica is interested in buying certain equipment lines on an OEM basis as well as selling our own Brazilian-made lines.

"Considering the import situation, it seems to be a practical idea," Eicher said.

In addition to card readers, sorters and tape drive units, Burroughs products available on an OEM basis will include its B9247 high-speed, wide-line printer which began production late last year in the company's Sao Paulo manufacturing plant.

McDonald indicated Brazilian production of the B9247 will account for half of the worldwide demand for this sort of printer within two years.

Two UK Firms Land in Colonies

Two British firms have landed in New York and Cambridge, Mass., to establish business in the U.S.

Applied Computing & Software (ACS) America has established an office at 964 Third Ave., New York, N.Y. 10022 under the direction of Peter Ruscoe.

The firm, established to provide services to U.S. firms and UK multinationals, will concentrate on four of the eight areas offered by its parent firm, ACS Ltd.

These include planning for minicomputer and turnkey systems; use of a programming method which is said to cut development costs; supply of technicians; and project work, often for a fixed price.

Management Systems & Programming Ltd. (MSP) has established an office at 133 Mount Auburn St., Cambridge, Mass. 02138. MSP developed and markets a data dictionary, Datamanager, as well as Testmanager and Projectmanager.

"For the sake of the whole UK software industry, it is vital that we prove the worth of our products in the U.S.," MSP Chairman David Gomes da Costa said.

Milgo Takes 40-Plus Off European Market

MIAMI – Milgo Communications' 40-Plus CRT terminal has been withdrawn from the European market.

Specific reasons for the withdrawal were not given because any such announcement might tip off others as to the changes Milgo might make, according to a spokesman for ICC/Milgo.

The spokesman said it will be about six months before Milgo can evaluate the costs and decide whether to make the modifications Racal Milgo Ltd. has requested in order to make the terminal "suitable" for it to sell in Europe.

For the U.S. market, Milgo is planning a fall announcement of three protocols for the 40-Plus. They include the Honeywell 7700, IBM 3275 and Univac Uniscope 100/200, the spokesman added.

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Because of Limits on DP Import

Burroughs' Brazilia

By Donald M. Best

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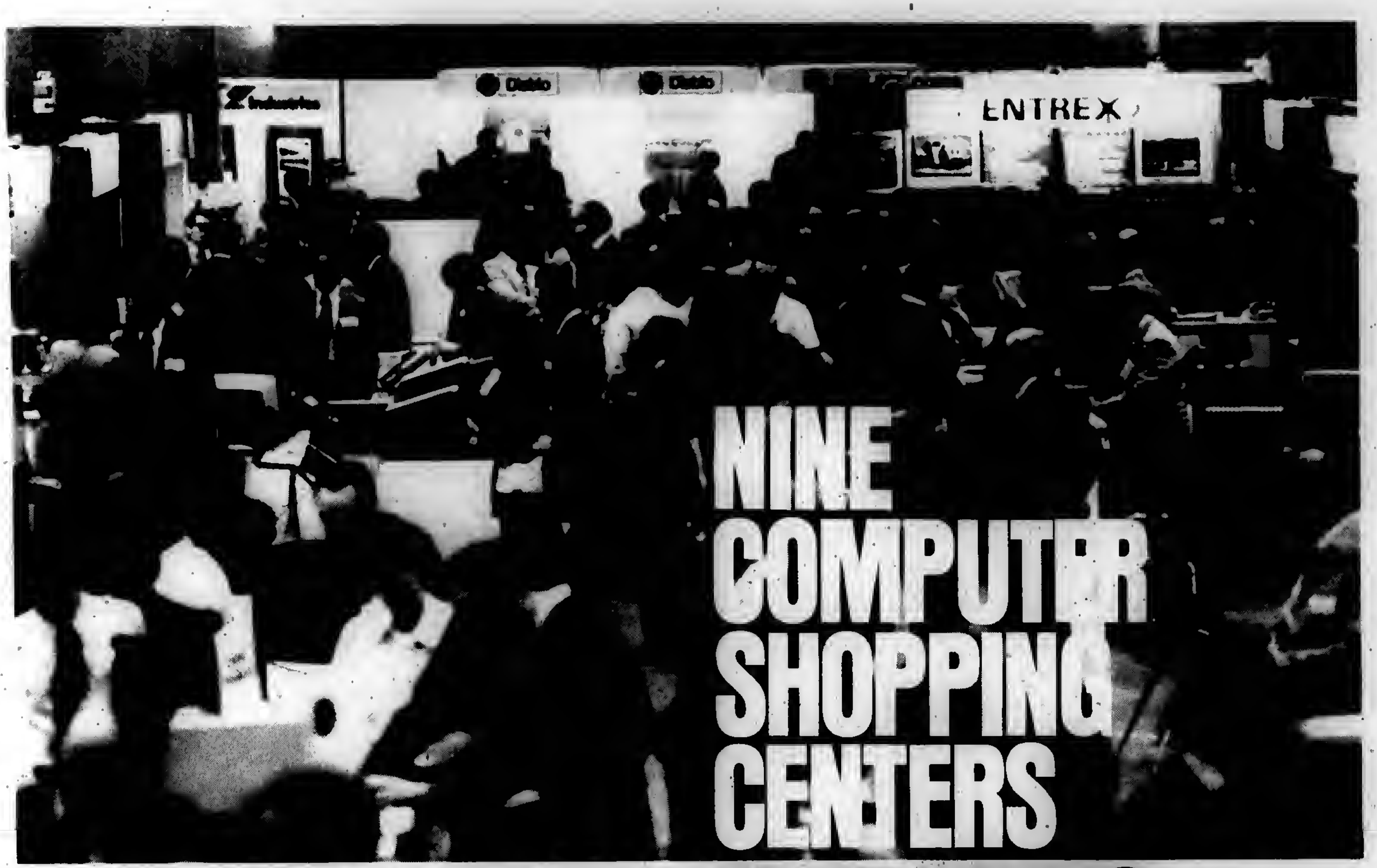

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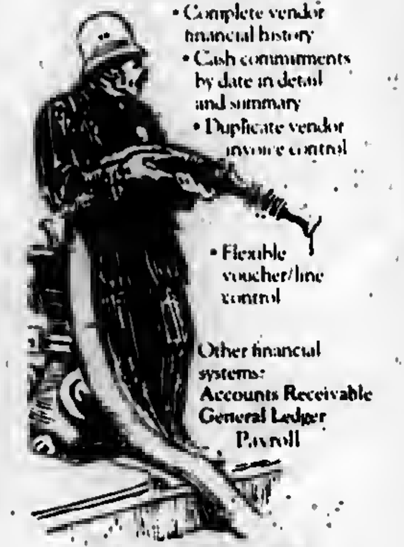

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NCSS Rises

NORWALK, Conn. – National CSS, Inc.'s (NCSS) first-quarter earnings rose to $754,000 or 66 cents a share compared with $511,000 or 46 cents a share in the same period last year.

The firm recorded investment tax credits of $140,000 in the recent period and $25,000 in the 1975 quarter.

Revenues reached $10.2 million compared with $8.6 million.

AJ Earnings, Revenues Up 30% in Year

SUNNYVALE, Calif. – Anderson Jacobson, Inc.'s (AJ) revenues and earnings advanced 30% in the year ended March 31.

The year marked the fifth consecutive year in which the firm achieved substantial increases in revenues and earnings, according to Raymond E. Jacobson, president and chairman.

"Over this period the company has achieved an average compound growth in both net income and revenue of about 50% per year.

"This is a record of which we can justifiably be proud as it must place our company among the top tier of growth companies in the world," he said.

During 1976, revenues reached $17.3 million compared with $13.4 million in 1975 while earnings totaled $864,431 or 35 cents a share compared with $663,906 or 27 cents a share last year.

International operations progressed "very satisfactorily" during the year and are expected to provide an increasingly significant fraction of consolidated revenues as time goes on, Jacobson said.

Greyhound Net Gains in Quarter

PHOENIX – Greyhound Computer Corp. reported earnings of $356,000 or 8 cents a share for the first quarter ended March 31, up from $49,000 or 1 cent a share in the same period last year.

Revenues were $14.5 million, down from $15.8 million in the year-ago quarter. This decline resulted both from fewer computer leasing rentals and from reduced data services activities in the U.S. and the UK, according to Olie E. Swanky, president.

The increase in earnings was primarily attributable to lower short-term interest rates, relatively stable computer leasing activities and reduction of data services losses brought about by the disposition of four U.S. data centers in late 1975 and early 1976, he said.

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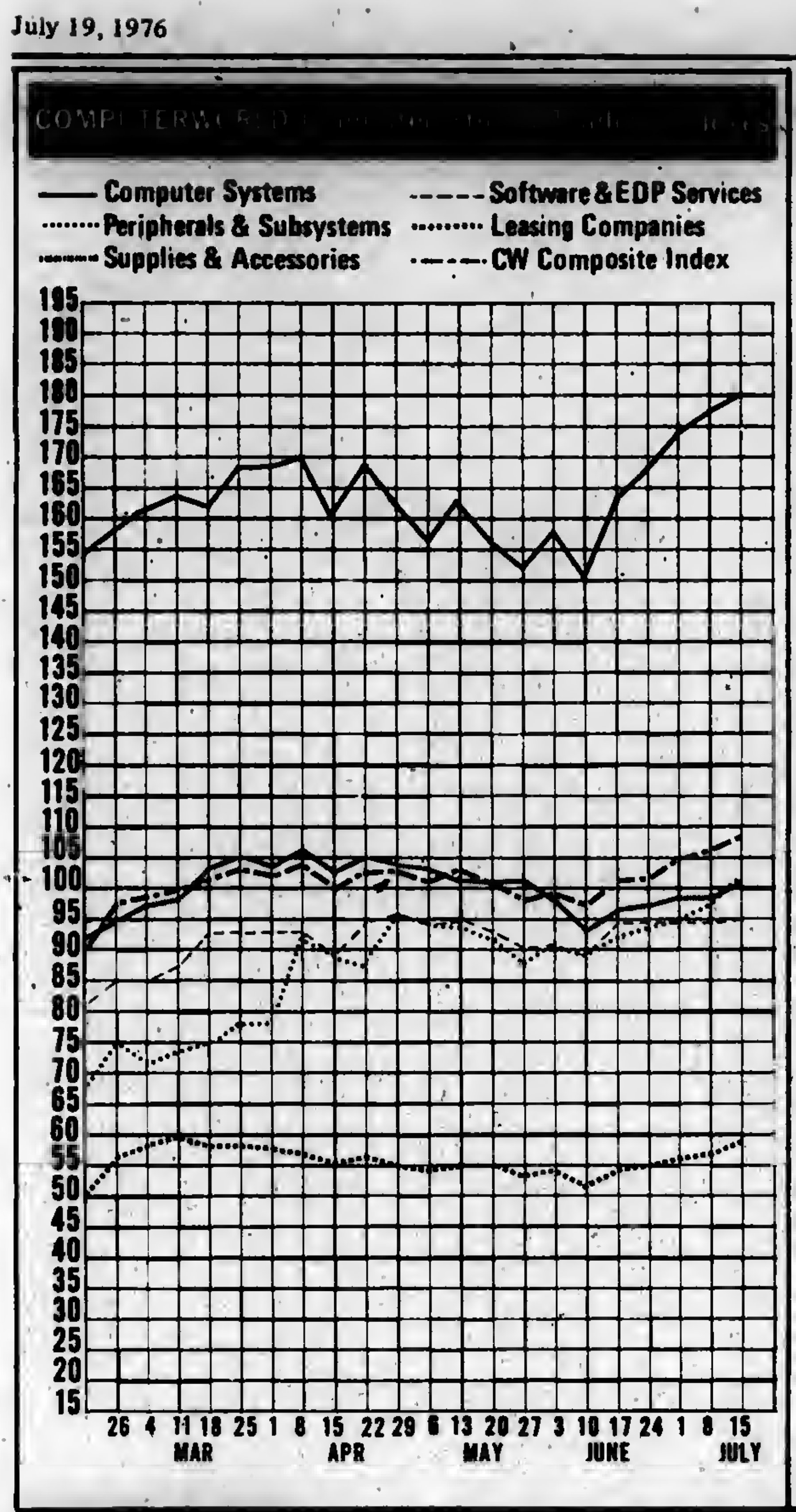

Earnings Reports

STANDARD REGISTER
Three Months Ended March 31

	1976	1975
Shr Ernd	$.72	$1.16
Revenue	41,356,000	42,237,000
Earnings	1,542,000	2,491,000

TRILOG ASSOCIATES
Nine Months Ended April 24

	1976	1975
Shr Ernd	.03	.06
Revenue	1,676,608	1,420,422
Tax Cred	7,423	31,661
Earnings	32,707	76,084

MULTIPLE ACCESS
Year Ended March 31

	1976	1975
Shr Ernd	.....	$.55
Revenue	$35,993,016	28,926,183
aSpec Chg	2,684,710	354,677
Earnings	(245,322)	1,564,570

a-1976 period includes write-off of investment in TCC, Inc.; 1975 figures restated to remove TCC accounts and account for investment in TCC on equity basis.

TECHNALYSIS
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.19	$.24
Revenue	1,859,323	1,547,130
Earnings	107,120	131,223

COMPUTER HORIZONS
Year Ended Feb. 29

	a1976	1975
Shr Ernd	.....	$.10
Revenue	$2,768,352	2,643,817
Disc Op	.....	9,379
Earnings	(42,166)	58,431

a-Reflects change in method of valuing marketable equity securities.

DI/AN CONTROLS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.16	$.27
Revenue	743,112	1,052,706
Tax Cred	59,100	103,226
Earnings	130,121	222,085

ECRM
Three Months Ended April 3

	1976	1975
Shr Ernd	$.05	.....
Revenue	1,624,700	$1,246,000
Spec Cred	19,600	.....
Earnings	61,700	(150,000)

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 14, 1976

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COMPUTER SYSTEMS

EXCH		PRICE: 1976 RANGE (1)	CLOSE JUL 14 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	94-109	104	+2 3/8	+2.3
O	COMPUTER AUTOMATION	10- 19	17 3/8	- 3/4	-4.1
N	CONTROL DATA CORP	18- 27	24 7/8	+ 5/8	+2.5
N	DATA GENERAL CORP	40- 60	55 5/8	+1 3/4	+3.2
O	DATAPOINT CORP	24- 46	45 1/2	+ 3/4	+1.6
O	DIGITAL COMP CONTROL	2- 7	7 1/4	+ 1/8	+1.7
N	DIGITAL EQUIPMENT	138-181	178 3/4	+ 3/4	+0.4
N	ELECTRONIC ASSOC.	2- 5	2 7/8	+ 1/8	+4.5
A	ELECTRONIC ENGINEER.	7- 16	10	-2 1/8	-17.5
N	FOXBORO	28- 46	43 3/4	+1 1/4	+2.9
O	GENERAL AUTOMATION	5- 11	7	- 1/4	-3.4
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	116 5/8	0	0.0
N	HONEYWELL INC	34- 56	51 3/4	+1	+1.9
N	IBM	227-280	276 5/8	-1 3/8	-0.4
O	MANAGEMENT ASSIST	1- 3	2 1/4	+ 1/4	+12.5
O	MEMOREX	19- 33	30 1/8	-1 5/8	-5.1
O	MICRODATA CORP	10- 27	25 3/4	- 1/4	-0.9
O	MODULAR COMPUTER SYS	9- 14	12 1/2	0	0.0
N	NCR	24- 36	35 1/8	+ 1/2	+1.4
O	PRIME COMPUTER INC	4- 13	12 1/4	+ 1/4	+2.0
N	PERKIN-ELMER	19- 27	24 3/4	+ 7/8	+3.6
N	RAYTHEON CO	45- 65	65	+3	+4.8
N	SPERRY RAND	40- 52	50 3/4	0	0.0
O	SYCOR INC	20- 31	26 1/4	0	0.0
A	SYSTEMS ENG. LABS	6- 10	9 7/8	+1	+11.2
N	VARIAN ASSOCIATES	13- 17	16 1/4	+ 3/4	+4.8
A	WANG LABS.	11- 20	17 3/8	+1 1/4	+7.7

LEASING COMPANIES

EXCH		PRICE: 1976 RANGE (1)	CLOSE JUL 14 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	+1 1/2	+25.0
A	COMMERCE GROUP CORP	2- 3	2 7/8	+ 1/8	+4.5
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	0	0.0
M	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	5- 8	8 1/8	+ 1/2	+6.5
A	GREYHOUND COMPUTER	3- 8	7 3/8	- 1/8	-1.6
N	ITEL	6- 19	14 5/8	+ 3/4	+5.4
N	LEASCO CORP	6- 18	17 3/4	+3 3/4	+26.7
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NSC INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/4	+ 3/8	+5.0
N	U.S. LEASING	7- 12	11 1/4	+ 3/8	+3.4

SOFTWARE & EDP SERVICES

EXCH		PRICE: 1976 RANGE (1)	CLOSE JUL 14 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	0	0.0
O	ANACOMP INC	9- 11	9	0	0.0
A	APPLIED DATA RES.	2- 4	4	+ 5/8	+18.5
N	AUTOMATIC DATA PROC	17- 35	34 3/4	+1 3/8	+4.1
O	COLEMAN AMERICAN COS	3- 6	3 1/8	0	0.0
O	COMPUTER DIMENSIONS	3- 7	4	- 1/2	-11.1
O	COMP ELECTION SYSTMS	5- 9	7 1/4	0	0.0
O	COMPUTER HORIZONS	1- 2	2 1/4	0	0.0
O	COMPUTER NETWORK	2- 6	3 1/2	0	0.0
N	COMPUTER SCIENCES	4- 8	7 1/8	0	0.0
O	COMPUTER TASK GROUP	1- 1	1 1/8	- 1/4	-18.1
O	COMPUTER USAGE	3- 6	3 3/8	- 1/8	-3.5
O	COMSHARE	2- 9	8 1/4	+1 1/4	+17.8
O	DATA DIMENSIONS INC	2- 4	3 3/8	0	0.0
O	DATATAB	1- 1	7/8	- 1/8	-12.5
N	ELECTRONIC DATA SYS.	12- 16	13 3/8	+ 3/8	+2.8
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 5/8	- 1/8	-7.1
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	3 3/8	+ 3/8	+12.5
O	KEYDATA CORP	3- 5	2 5/8	- 1/8	-4.5
O	LOGICON	4- 4	3 1/2	- 1/8	-3.4
A	MANAGEMENT DATA	1- 2	2	- 1/8	-5.8
A	NATIONAL CSS INC	13- 25	23 1/2	0	0.0
A	ON LINE SYSTEMS INC	19- 22	19 1/4	- 5/8	-2.1
N	PLANNING RESEARCH	3- 5	4	- 1/4	-5.8
O	PROGRAMMING & SYS	1- 1	1/2	+ 1/8	+33.3
O	RAPIDATA INC	3- 5	2 7/8	+ 1/8	+4.5
O	REYNOLDS & REYNOLDS	13- 21	17 1/4	+1	+6.1
O	SCIENTIFIC COMPUTERS	1- 1	1/2	0	0.0
O	TYMSHARE INC	19- 28	26 7/8	+1 1/2	+5.9
A	URS SYSTEMS	3- 5	3 5/8	- 3/8	-9.3
N	WYLY CORP	2- 7	3 1/8	+ 3/8	+13.6

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE: 1976 RANGE (1)	CLOSE JUL 14 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	9- 13	11 1/8	+1 3/8	+14.1
O	ADVANCED MEMORY SYS	4- 10	8 1/2	+1 1/8	+15.2
N	AMPEX CORP	5- 9	9 1/4	+ 3/4	+8.8
O	ANDERSON JACOBSON	2- 4	3 1/8	0	0.0
O	APPLIED DIG DATA SYS	13- 25	24 1/4	-1	-3.9
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/2	+ 3/4	+9.6
A	BOLT,BERANEK & NEW	7- 11	9 7/8	- 1/8	-1.2
N	BUNKER-RAMO	5- 10	9 1/4	- 1/8	-1.3
A	CALCOMP	4- 7	6 1/2	+ 3/4	+13.0
O	CAMBRIDGE MEMORIES	1- 6	1 3/8	-1	-42.1
N	CENTRONICS DATA COMP	20- 36	32 1/8	- 5/8	-1.9
O	CODEX CORP	22- 42	31 1/2	+2	+6.7
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 7/8	+ 1/8	+3.3
O	COMPUTER CONSOLES	4- 7	6	+ 1/4	+4.3
A	COMPUTER EQUIPMENT	1- 3	1 7/8	+ 1/4	+15.3
O	COMPUTER TRANSCEIVER	1- 3	1 1/4	+ 1/8	+11.1
O	COMTEN	4- 9	9	+1	+12.5
N	CONRAC CORP	20- 25	24 3/8	+2 3/4	+12.7
O	DATA ACCESS SYSTEMS	1- 4	3 1/2	0	0.0
O	DATA 100	7- 13	9	- 1/2	-5.2
A	DATA PRODUCTS CORP	5- 14	13 3/8	+ 1/2	+3.8
O	DATA TECHNOLOGY	1- 2	1 5/8	+ 1/8	+8.3
O	DATUM INC	1- 2	2	- 1/4	-11.1
O	DECISION DATA COMPUT	1- 4	1 3/4	- 1/4	-12.5
O	DELTA DATA SYSTEMS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	3 1/4	+ 3/4	+30.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/4	0	0.0
N	HARRIS CORP	34- 52	51 3/4	+3 1/4	+6.7
A	INCOTERM CORP	9- 20	12	- 1/4	-2.0
O	INFOREX INC	3- 7	4	+ 1/8	+3.2
O	INFORMATION INTL INC	10- 18	13 1/2	0	0.0
O	INTEL CORP	60-109	70 1/2	+1 1/2	+2.1
A	LUNDY ELECTRONICS	4- 7	4 3/8	- 1/8	-2.7
O	MSI DATA CORP	3- 7	7 1/8	+ 3/8	+5.5
A	MILGO ELECTRONICS	15- 21	18 5/8	- 5/8	-3.2
N	MOHAWK DATA SCI	3- 9	9 1/4	+ 1/2	+5.7
O	PENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	6	+ 1/4	+4.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 13	5	0	0.0
O	QUANTOR CORP	4- 6	5 1/2	+ 3/8	+7.3
O	RECOGNITION EQUIP	6- 11	8 3/4	- 1/2	-5.4
N	SANDERS ASSOCIATES	6- 11	9 3/4	+ 3/8	+4.0
O	SCAN DATA	2- 4	2 1/2	+ 3/8	+17.6
O	STORAGE TECHNOLOGY	9- 13	12 7/8	+2	+18.3
O	T BAR INC	5- 10	5 7/8	+ 1/4	+4.4
O	TALLY CORP.	4- 6	4 3/4	- 1/4	-5.0
O	TEC INC	3- 5	3 1/2	0	0.0
N	TEKTRONIX INC	45- 64	64	+1 3/4	+2.8
N	TELEX	2- 5	4 3/8	+ 5/8	+16.6
O	WANGCO INC	11- 22	21 1/4	+ 1/8	+0.5
O	WILTEK INC	2- 2	2 3/4	- 3/8	-12.0

SUPPLIES & ACCESSORIES

EXCH		PRICE: 1976 RANGE (1)	CLOSE JUL 14 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	+ 1/8	+4.0
O	BALTIMORE BUS FORMS	4- 5	3 1/2	0	0.0
A	BARRY WRIGHT	6- 10	8	+ 1/8	+1.5
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	32- 42	32 3/8	+ 5/8	+1.9
O	DUPLEX PRODUCTS INC	15- 24	15	+ 1/4	+1.6
N	ENNIS BUS. FORMS	6- 8	6 5/8	- 1/8	-1.8
O	GRAHAM MAGNETICS	8- 13	9	+ 1/2	+5.9
O	GRAPHIC CONTROLS	13- 19	14 3/4	0	0.0
N	3M COMPANY	53- 65	62 1/8	+4 1/4	+7.3
O	MOORE CORP LTD	40- 51	42 1/2	+2	+4.9
N	NASHUA CORP	11- 17	16 1/8	+ 1/2	+3.1
O	STANDARD REGISTER	15- 19	16 1/4	+ 3/4	+4.8
O	TAB PRODUCTS CO	5- 10	10	+ 1/2	+5.2
N	UARCO	21- 25	21 1/2	+ 1/2	+2.3
A	WABASH MAGNETICS	4- 8	8	+ 5/8	+8.4
N	WALLACE BUS FORMS	19- 25	20 1/4	+ 5/8	+3.1

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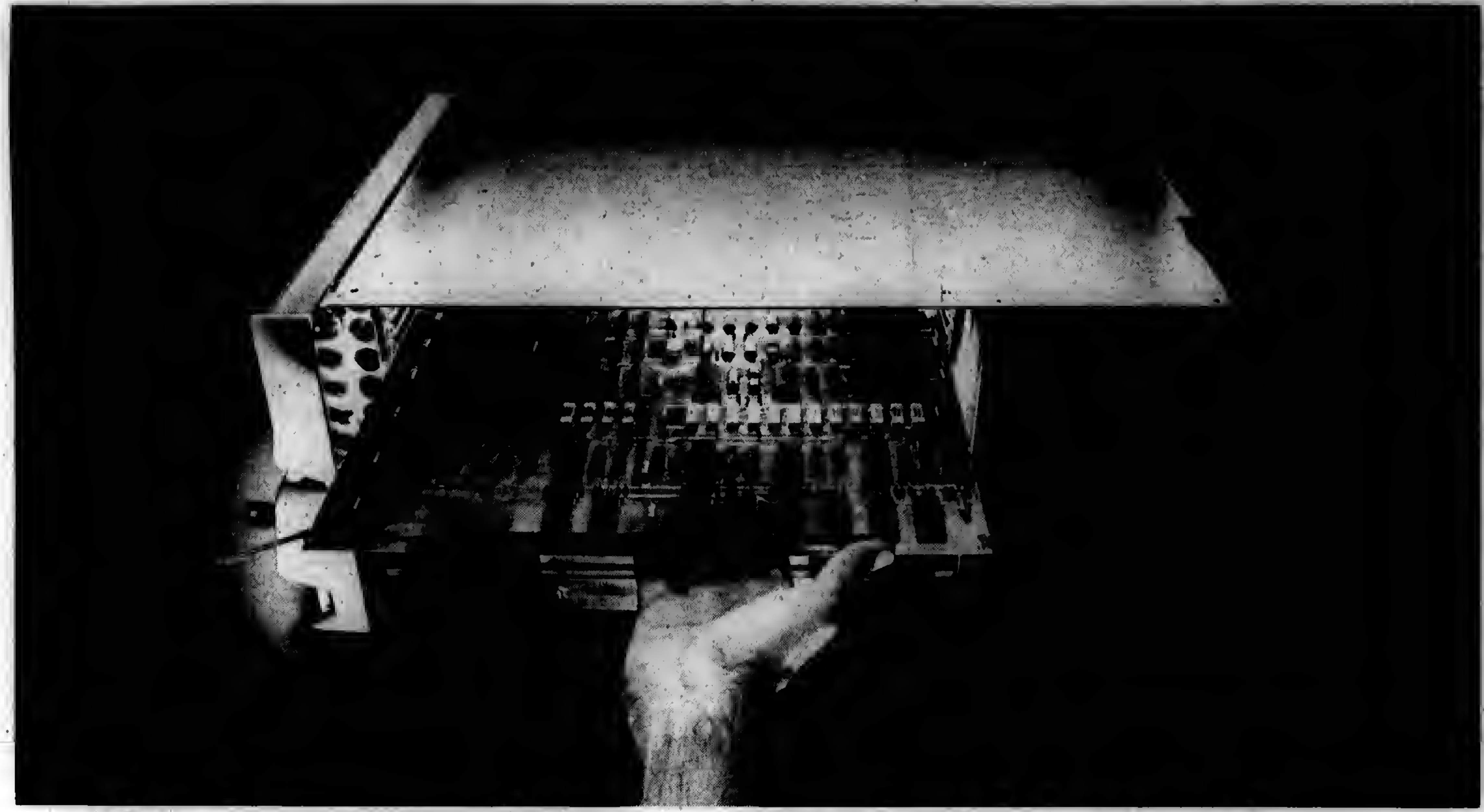

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NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper   Second-class postage paid at Boston, Mass., and additional mailing offices   © 1976 by Computerworld, Inc.

/year   July 26, 1976   Vol. X, No. 30

No Medals Won, But DPers Perform Well at Olympics

By John P. Hebert
Of the CW Staff

MONTREAL – Amid the confusion of politically oriented national boycotts and dazzling performances of the 11,592 athletes taking part in the 21st Summer Olympic Games here are relatively unnoticed, smooth-running computer support systems and 1,200 associated personnel.

If medals were handed out for behind-the-scenes support, the massive work force and systems would surely corner a few.

The support systems and the personnel operating them are just that, however – behind-the-scene competitors in a constant game of "beat-the-clock."

When the first perfect score in Olympic history – a 10.00 – was received by Nadia Comaneci last week, a computer complication arose. CRT terminals used to input scores for the events on the stadium floor were formatted to accept only three-digit numbers.

Computer support people worked on the CRT screen formats for five minutes to change the number of acceptable digits from three to four.

"I can't cut off the computers until 3 a.m. or so. It had to be done overnight because we had to wait for the events to finish and for the results to be compiled," Alain Roy, director of the results system for the Olympics, explained.

For most of the past week and through this week, the terminals on the stadium floor have been able to cope with perfect scores.

A Cute Story

Comaneci's five perfect-score performances on the uneven parallel bars and the beam, which caused problems with the computer system, "made a story [for the press] because it was cute," according to Alain Roy.

It is ironic the same press which reported the difficulties with the computer

(Continued on Page 5)

(UPI)

Rumania's Nadia Comaneci flies from the uneven bars to a perfect 10.00 score – which was rejected by the Olympics computer.

Court Rebuffs IBM Document Appeal

By Edith Holmes
Of the CW Staff

NEW YORK – IBM has once again been rebuffed in its efforts to keep certain internal company documents out of sight during the current antitrust case against it.

The U.S. Second Circuit Court of Appeals here swiftly denied IBM's request for protection for some 20,000 documents involved in the case in a meeting here last week.

After hearing the 15-minute arguments from IBM and government attorneys, the three-judge panel rendered its decision without leaving the bench [CW, July 19].

That decision effectively upheld the order of Judge David N. Edelstein, who is hearing the case in the district court, requiring IBM to begin immediate production of the documents to the Department of Justice.

In going to the appeals court, IBM sought to reverse Edelstein's order by contending these documents should be protected because they are either materials prepared specifically for this trial or privileged under the special attorney/client relationship.

In making their ruling, the judges did not discuss the merits of the argument by either side, instead expressing the reluctance of the court to review a question that is properly the decision of the district court judge trying the case.

To provide the corporation with protection for its documents while the case is still on trial would represent "a departure from the normal way of doing things," the court said, referring to a similar decision it recently made in a case involving Xerox Corp.

IBM argued if the appeals court did not grant its petition, the corporation would have to produce some 5,000 documents to the government immediately, follow-

(Continued on Page 4)

DP a Vital Tool in Developing, Transmitting Mars Photographs

By John P. Hebert
Of the CW Staff

PASADENA, Calif. – Computer systems are playing an essential role in transmitting and developing the pictures of Mars' surface taken by Viking 1 cameras.

After the cameras on board the Viking 1 lander have captured pictures of the red planet and stored them on Intel Corp. 1M-byte memory systems in digital form, computers on board the craft orient the radio transmitters toward earth [CW, July 12].

The digital pictures arrive 200 million miles away at the National Aeronautics and Space Administration's (Nasa) Jet Propulsion Laboratory (JPL) here where computers process the data and store it on magnetic tape, according to a JPL Image Processing Laboratory (IPL) spokesman.

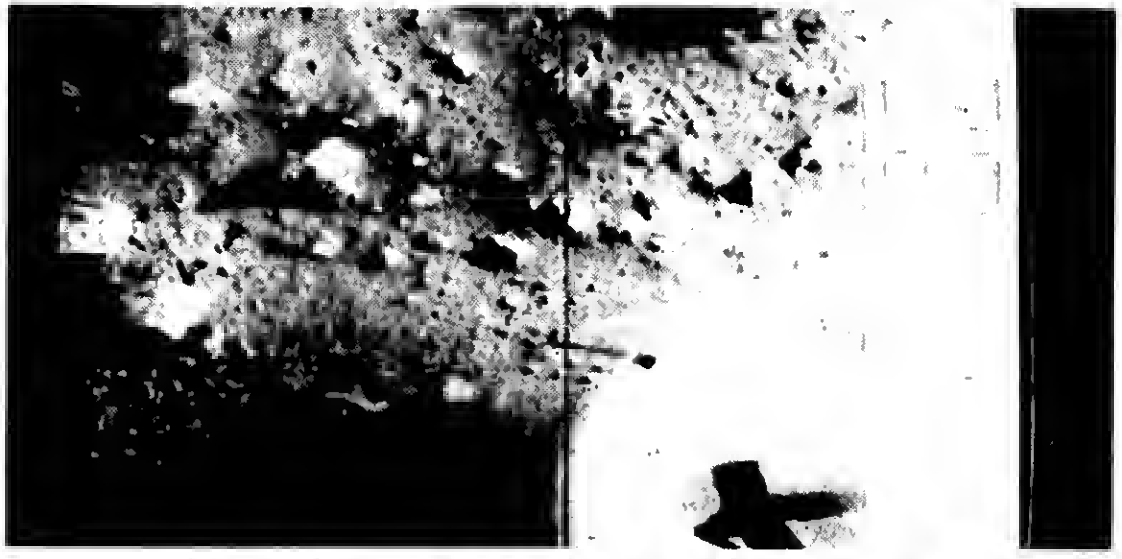
At one of three image processing laboratories at JPL, the pictures are displayed on CRT screens, he said.

At this point, a bit error-correction process eliminates erroneous images resulting from incorrect telemetry data.

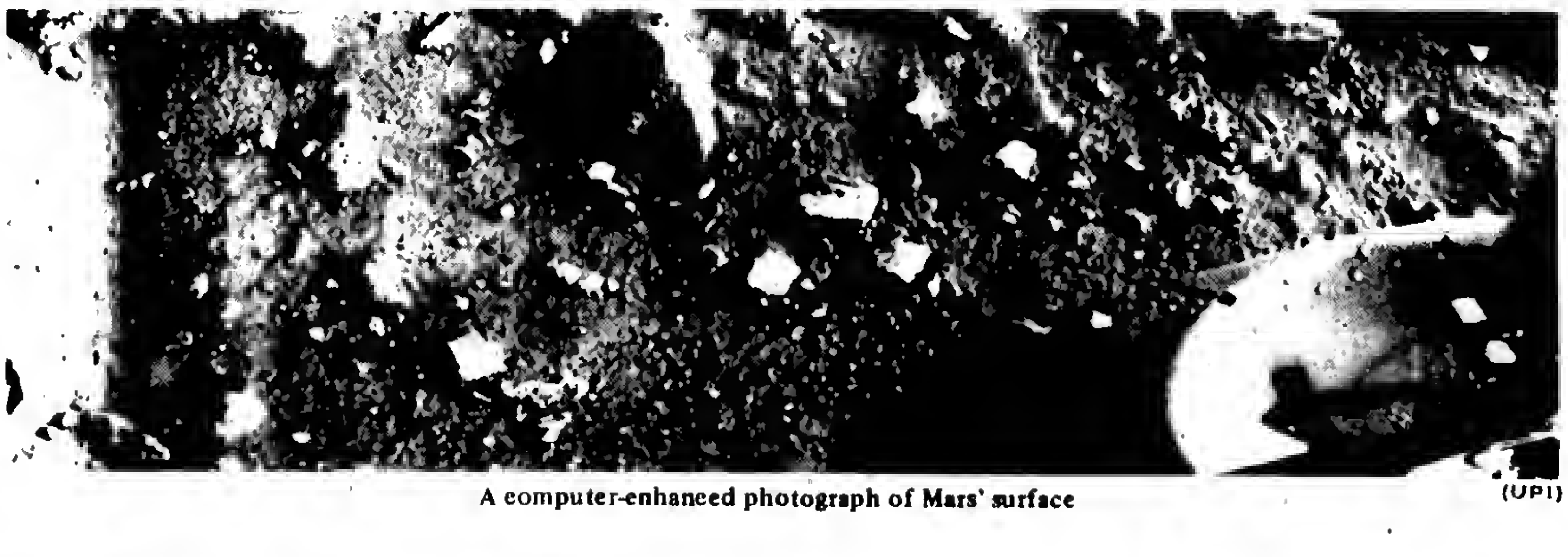
As in the case of archaeologists reconstructing a whole skeleton from the intact remains of a prehistoric relic, the project scientists remove the defects in a painstaking, one-at-a-time manner and use the remaining good data to make an accurate whole picture, the spokesman said.

At this point, researchers perform processes such as contrast enhancement – setting the dynamic range of data

(Continued on Page 5)



First picture sent from Mars is displayed on JPL's Hazeltine CRT. (UPI)



A computer-enhanced photograph of Mars' surface (UPI)

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc. 797 Washington St., Newton, Mass. 02160

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Documentation Still Complete

Privacy Seen No Problem to Medicine

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Contrary to fears expressed by private physicians, the Privacy Act of 1974 has not affected medical treatment of individuals nor has it resulted in incomplete documentation of treatment, according to David O. Cook, deputy assistant secretary of defense for administration.

Cook was assisted in his testimony before the Privacy Protection Study Commission here last week by a table full of military doctors and other personnel, and at times it was not clear who was talking.

In the panel's general review of medical and personnel recordkeeping practices, however, these spokesmen gave testimony on confidentiality of military separation numbers (SPN) that one commission member described as "shrewd."

The SPNs were used in computerized systems to code servicemen as mentally unstable, bedwetters or having unclean habits or venereal diseases, for example.

After it was discovered these codes were familiar to employers in the private sector and were being used to evaluate ex-servicemen for jobs, congressional critics insisted the program be suspended. New discharge papers were offered to veterans without the codes.

Last week Cook said he didn't know whether veterans were signing waivers allowing third parties access to these records or even whether the SPN system had been changed. No one else seemed to know either, indicating this issue is not yet dead, observers said.

Lessons to Learn

While military medicine differs from private practice since there is no confidential doctor/patient relationship in uniform, some lessons can be learned from the military's one-year experience with the privacy act, the committee was told.

Individuals are permitted "unrestricted access" to medical records except in cases where information about "a poor prognosis or psychiatric condition" could prove harmful to the individual. In such cases a physician assists in interpreting the record, Cook's testimony said.

Medical records are not used by promotion review boards; however, they are considered in cases where "human reliability" is a factor. Security clearance for duty on a Polaris submarine or a missile silo were mentioned as examples.

All disclosures of information from the comprehensive medical records to third parties must be authorized by the individual or his legal representative.

However, only information about communicable diseases, rape, child abuse and gunshot wounds, for example, are supplied to law enforcement agencies without individual authorization if medical people are first to discover a condition requiring such a report, according to Col. James W. Johnson, an attorney with the Air Force's Judge Advocate General's office.

Few Illegal Disclosures Feared

All requests must state a purpose for the information, and all requests are funneled through a military official responsible for liaison work between the military and the law enforcement agencies. "These people know who they are dealing with" and few illegal disclosures are feared in this area, Johnson added.

Records on a serviceman's problems with drugs or alcohol abuse are exchanged freely within the military and the Veterans Administration (VA), but they go no further, testimony indicated.

Following discharge from the military, the VA takes over the serviceman's relationship with the government.

The Department of Veterans Benefits operates a massive pension and loan program. In addition, the Department of Medicine and Surgery treats as many as 180,000 veterans and their beneficiaries and dependents per day in its 171 hospitals, 213 clinics and 85 nursing homes, officials testified.

The education pension system and the medical records are maintained separately at the present time, but officials expect to upgrade this system to a single nationwide teleprocessing system known as Target, a plan that has drawn considerable criticism on grounds of privacy.

'Target' Said to Incorporate Tight Data Security Measures

WASHINGTON, D.C. – The Target system will incorporate tight security and data management techniques to safeguard the sensitive data the proposed on-line system will place at Veterans Administration (VA) employees' fingertips.

Target will allow local and regional offices to access and manipulate veterans' education and medical records via a communications-based computer system, according to Ralph Smith, director of the VA's systems development service.

Target will utilize three regional DP centers, hundreds of intelligent CRTs and provide a centralized veterans file with decentralized accounting and locator system, he said.

While its request for proposal (RFP) has been criticized for not setting forth any particular security requirements, officials told members of the Privacy Protection Study Commission here last week it would be "the best in the business."

VA officials envision audit trails of every data base update, with random audits to assure quality of records.

Each individual with access to the system will be required to identify himself with a nondisplayed personal password, and records will be accessible only with the veteran's service number – in most cases the Social Security number, Smith explained.

Under the present plan, terminals in regional offices could be rendered inoperative upon demand, and keylocks on terminals and controllers will make the system inoperative after business hours.

Sophisticated software for transaction processing and data base management will assure data integrity.

The National Security Agency will assist the VA in developing a risk management program, Smith said.

While 47% of the U.S. population is estimated to be eligible for VA benefits of one kind or another, it is doubtful that as many will be in this system, officials said.

About 31 million claim numbers have been issued over the years, Smith said. The number is higher as a result of the emphasis on Outreach for Vietnam-era veterans.

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***CW Special Report on DATA COMMUNICATIONS TERMINALS Follows Page 26**

Decisions

"Okay, Whitlow, you've marketed 1,000 SyncSorts. Now would you like to try for 2,000?"

(Sure. If IBM keeps making hardware, how can we miss?)

Call (201) 568-9700

If the question is sorting, the answer is SyncSort.

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Sometimes we almost feel like Archimedes. It's as though we've discovered a natural law of our own.

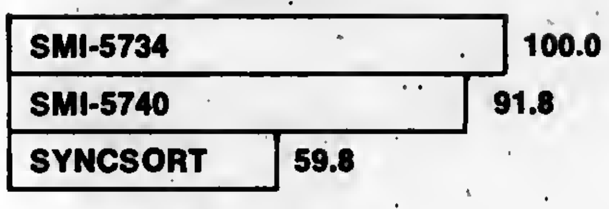
Even the Ph.D.'s around our place regard our discovery with a certain amount of awe. They refer to it, in hushed tones, as the "SyncSort Factor."

It's a progression that goes something like this:

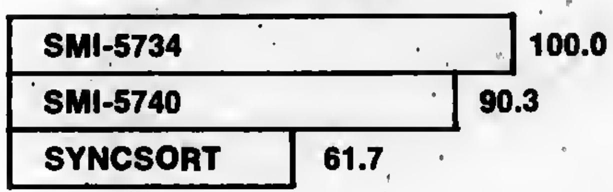
1. IBM will continue to make and market computers. (That seems like a safe $2 bet.)
2. The busy people who use these computers will naturally require the best sort package they can obtain. (Sorting is the most frequent job on any commercial computer.)
3. These people — being intelligent men and women — will sooner or later find their way to SyncSort III-and-a-half. (It's the best sort package on the market.)
4. None of the foregoing will harm our business. (We will continue to update our package so that it will always stay ahead of the competition.)
5. This will lead to more sales and more improvements. (Maybe we should call our discovery the "Law of Perpetual Sorting Improvement!")

If you'd like a graphic representation of the "SyncSort Factor" take a look at the picture below. These graphs depict what happens when you match SyncSort III-and-a half against other sorts on the market today:

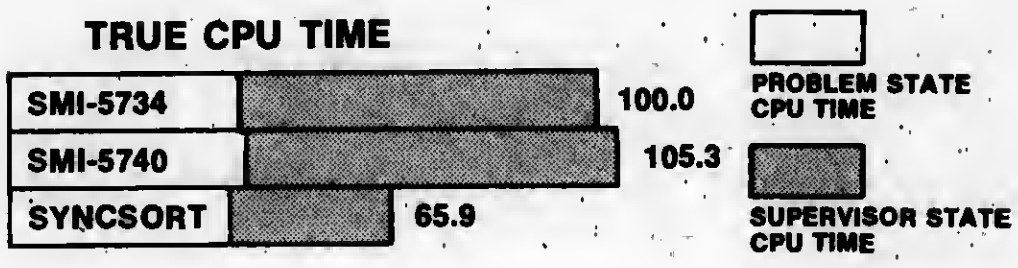
I/O ACTIVITY



ELAPSED TIME



TRUE CPU TIME



Performance is, of course, the bottom line in sorting. But it's not the only thing you should consider in choosing a sort package. Is the sort versatile, for example? Will it support 3350 devices in their native mode without having to sysgen a new system? SyncSort III-and-a-half *will*.

And how's the sort support? Will anybody help you phase the package in when you start using it? If you call the other supplier with a tricky little question, will there be anybody there willing to take the time and effort to give you a reasonable answer?

We will. In fact, we *like* receiving questions from users. It's a hangover from the days when we were pioneering all those developments that opened up the sorting industry. Once an explorer, always an explorer!

The foregoing are some reasons why SyncSort has been so successful in penetrating its market. (In fact, we think we may have obtained a bigger slice of our market than any other software product.)

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WHITLOW
COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

IBM Document Appeal Rebuffed Again

(Continued from Page 1)

ing these later with many more.

"Government counsel will read those documents and will gain a unique advantage," the lead IBM attorney, Thomas D. Barr, claimed.

But the "real and prejudicial" harm which IBM will suffer won't stop with this case, he continued.

Once they are entered into evidence and become public information, all, many or some of these documents will find their way into other cases – most notably those antitrust cases on the West Coast brought against IBM by California Computer Products, Inc. (Calcomp) and Memorex Corp., among others, he said.

The first of these cases, involving Calcomp, is scheduled to go to trial in Los Angeles in November.

'Worst Thing In the World'

Barr told the court he didn't want to appear before the judges in the ultimate appeal of U.S. vs. IBM and say he hadn't tried to resolve these problems earlier.

"The worst thing in the world would be to have a case like this dismissed on procedural grounds," he said, emphasizing the trial's size and complexity.

But precisely because of its bigness, the government maintained the case could not be dealt with "in a piecemeal fashion" by the appellate court.

Chief of the Justice Department's Appellate Section, B. Barry Grossman, said the government does not want to see the case reversed or dismissed because of error when it comes up for appeal. But such error is a risk to be taken, he said.

Delaying Tactic

If attorneys trying big cases become accustomed to appeals courts correcting errors while trials are still under way in the district courts, there will be no desire to speed up litigation, Grossman said.

Because it can easily become a delaying tactic, the writ of mandamus, which IBM was asking for in this instance, should be used sparingly, he argued.

IBM has brought up the issue of privileged documents almost since the beginning of this case, observers noted last week.

Twice earlier the firm has appealed to higher courts for protection for certain documents, but it has been rebuffed in each instance. In one case the Supreme Court handed down a order requiring the firm to obey the order of the district court requiring it to turn over documents to the government prosecutors.

In another case, Edelstein fined the firm $150,000 per day for contempt of court for not turning over the required documents. After exhausting all possible appeals, the firm complied and released the documents to the Justice Department.

U.S. Case in IBM Trial Seen Seven-Tenths Down the Road

By Edith Holmes
Of the CW Staff

NEW YORK – Seven-tenths down the road – that's how far the U.S. Government has come in the presentation of its antitrust case against IBM before the district court here, according to the lead attorney for the Justice Department.

Raymond M. Carlson came up with this figure during a recent conference and in response to Judge David N. Edelstein, who wanted to know how much of the government case lies ahead.

"That's very good," the judge commented.

But the IBM attorney charged with responsibility for the case was incredulous. "Seven-tenths toward completing your direct case?" Thomas D. Barr asked Carlson. To Edelstein he said: "Your Honor, I've got to tell you I don't think we are halfway."

Three-Tenths a Closer Estimate?

Even though there have been over 160 days of trial and the transcript of the proceedings is rapidly approaching 23,000 pages, the Justice Department doesn't seem to have reached the halfway point in the presentation it has outlined for the court.

The government has not indicated its witness list of approximately 107 people has been drastically reduced. Yet it has only called 33 of these people to the stand in the 14 months since the trial began. That's just a little over three-tenths of the total number scheduled to appear on behalf of the U.S.

'Fighting Machines' Phase

And, as the government moves into the "fighting machines" or "product announcement" part of the conduct phase of its suit, deposition and document testimony comprise the bulk of that presentation. Only one live witness is scheduled – Robert D. Schmidt – and he won't take the stand until late September or early October.

Issue-wise, the Department of Justice has just begun the second phase of its examination of IBM's conduct in the marketplace with fighting machines, having dealt with the practice of bundling services into hardware prices for the last 2-1/2 months.

Third Phase

The third phase of conduct is educational allowances, and that is currently slated to follow the fighting machines.

The government then has to bring to the court what amounts to the Telex case with regard to Justice Department charges that IBM monopolized the peripherals markets.

There are also contentions IBM acted to restrict leasing companies in their business as well, and these assertions will have to be probed in court.

Other Loose Ends

Remaining are some loose ends in the market definition aspects of the case, including testimony on the computer industry's market structure and on Singer's and Xerox's reasons for withdrawing from the business.

Finally the government will conclude with its conception of the economics of the industry.

Since May 1975, the government has attempted to define the market and structure of the computer industry, the areas which IBM has been said to have monopolized, the reasons for the RCA, General Electric and Xerox exits from the marketplace and the practice of bundling, which IBM is alleged to have used to further and to maintain its monopoly position.

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The Employee Retirement Income Security Act of 1974 effective January 1, 1976 mandates the recording of all hours worked and not worked, compensated and non-compensated, as well as all dollars affecting employee pension benefits.

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WANG

Despite Complications

Systems, Personnel Perform Smoothly at Olympics

(Continued from Page 1)

system are served by that very same computer system for news about event results.

This is the primary function of two IBM 370/145 mainframes, 106 IBM 3275/3284 CRT/printer terminals and six Texas Instruments, Inc. Silent 700 series terminals stationed at a total of 27 event sites in Quebec and Ontario, Roy said.

The computer system and 1,200 people must deliver a written, official document of competitors' scores to the 8,000-member press within 10 minutes of the close of each event, Roy said.

On-Site Inquiry

A second high-priority function involves a provision for on-site inquiry services to people in the press to retrieve information about the different sports taking place at the sites, which are up to 500 miles from the events taking place here.

Results must be received and tabulated from terminals and telecopiers at remote sites for archery, equestrian, shooting, yachting, football (soccer) and handball competition, Roy noted.

In addition, the results support center for the Comite Organisateur de Jeux Olympiques (Cojo) must prepare a summary paper of events twice daily at 7 a.m. and 8:30 p.m. The summary paper, Roy noted, has a circulation of 30,000.

Finally, a brochure of the results must be given to both the press and Olympic participants – 18,000 copies in all – two hours after the closing ceremonies in early August, he said.

The entire effort Roy directs "is a massive data entry operation" handled in "an isolated building" about two miles from the events at the main stadium in Olympic Village, he explained.

A total of 42 multidrop Bell Canada communications lines carry the information to the Cojo support center at 2,400 bit/sec, where two IBM 3705 communications controllers act as intermediaries to the dual CPUs, Rov said.

The system as a whole was well tested and it and all the data entry and other support people went through a number of rehearsals to ensure a minimum of problems when the actual competition commenced.

In addition, Bell Canada and IBM were very helpful in "the fastest on-line system implementation I've ever seen," Roy said.

Cojo Objective

The objective of the Cojo support center, Roy offered as a summary explanation, is to produce 12- to 15 million units of paper printouts during the games' two-week course.

Assuming 500 unit results as a peak output for one day's results and copies needed for 8,000 press people and organizations, 4 million units of paper detailing contestants' scores and events would be theoretically turned out in one day, Roy said.

Roy doesn't expect the burden to ever be that high, he said, but the center would be able to handle it if necessary.

The computer systems were rented by the Canadian government to handle only Olympic-related tasks, he said. At the end of the games, they and the 113 terminals will be dismantled and brought back to IBM and Texas Instruments.

As early as Aug. 1, the secondary CPU will be dismantled, while the primary system will operate until the end and is scheduled to be taken down on Aug. 16, Roy said.

Working on the computer support team for the games is "the most Interesting thing I've ever done," Roy said. He is a project manager for a Montreal firm.

Olympic Withdrawals Cause DP Problems

By a CW Staff Writer

MONTREAL – A burden has been placed on the support people working with the computer system at the Olympic Games here as a result of the 30 nations which have withdrawn from competition.

However, these obstacles are not a problem at all for the dual IBM 370/145 computer systems at the center, according to Alain Roy, director of the results support center for the Comite Organisateur de Jeux Olympiques (Cojo).

Describing the problem as "more political than technical," Roy said all that had to be done was to delete the names of countries participating, along with names of athletes, but the center had to be careful in determining which countries had officially pulled out of the games.

Of the 30 nations which have left for home, only 24 were officially registered in the first place, Roy said.

DP Helps Develop, Transmit Mars Surface Photographs

(Continued from Page 1)

in terms of black/white value – and edge enhancement – the process of filtering to make low-constrast, small objects more visible – he explained.

After the data has been massaged through manipulation on the CRT screens, the image is sent in an 8-bit digital format to Dicomed Corp. image recorders, which convert the information into a picture.

The IPL has Univac minicomputers; the Mission Test and Imaging System (MTIS) utilizes an IBM 360/65; and the third lab uses an IBM 360/75 CPU, he said.

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Also consider the cost of maintaining your on-line system. An article in the February 23rd issue of *Computerworld* points out that over half of the CICS users had to modify the package to meet their needs, at an average cost of over $10,000. With TASK/MASTER, few, if any, modifications are ever required. This could be one of the major reasons why year after year the *Datapro* survey of software package users shows TASK/MASTER ranked ahead of CICS in the all-important areas of ease of installation, ease of use, and throughput and efficiency.

For more information on why over 200 installations around the world have made TASK/MASTER *the* alternative, call 203/853-2884 or write today. Better yet, plan to attend a free one-day seminar which covers every aspect of selecting a communications monitor.

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Washington	8/18	Pittsburgh	9/1	Dallas	9/15

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Editorials

Lending an Ear to Users

A few tentative events seem to be pointing to the fact the computer industry is finally becoming more conscious of the needs of users.

Only a few short years ago every product was hailed as state-of-the-art and systems were described as being on the cutting edge of technology. But those types of phrases are fading away. Instead vendors talk about event-driven systems. And in many cases this means a user-originated transaction.

One supplier of banking equipment is experimenting with check authorization equipment that allows the consumer to operate the terminal instead of a teller or supermarket store employee.

A bank in North Carolina discovered customers enjoy using cash dispensers that are easy to use and that, more importantly, create a pleasant image so the consumer is not graphically reminded he is dealing with a dominant machine. And in the supermarkets, vendors are reconsidering their initial plans to eliminate prices from grocery items because of consumer disenchantment.

This kind of sensitivity to the concerns of the user will have long-run beneficial effects for both vendor and user. It will certainly hasten the evolution of terminal equipment into the customer's life-style. It may also finally begin to dispel some of the basic suspicion and distrust of computer systems by the public.

A Place in History

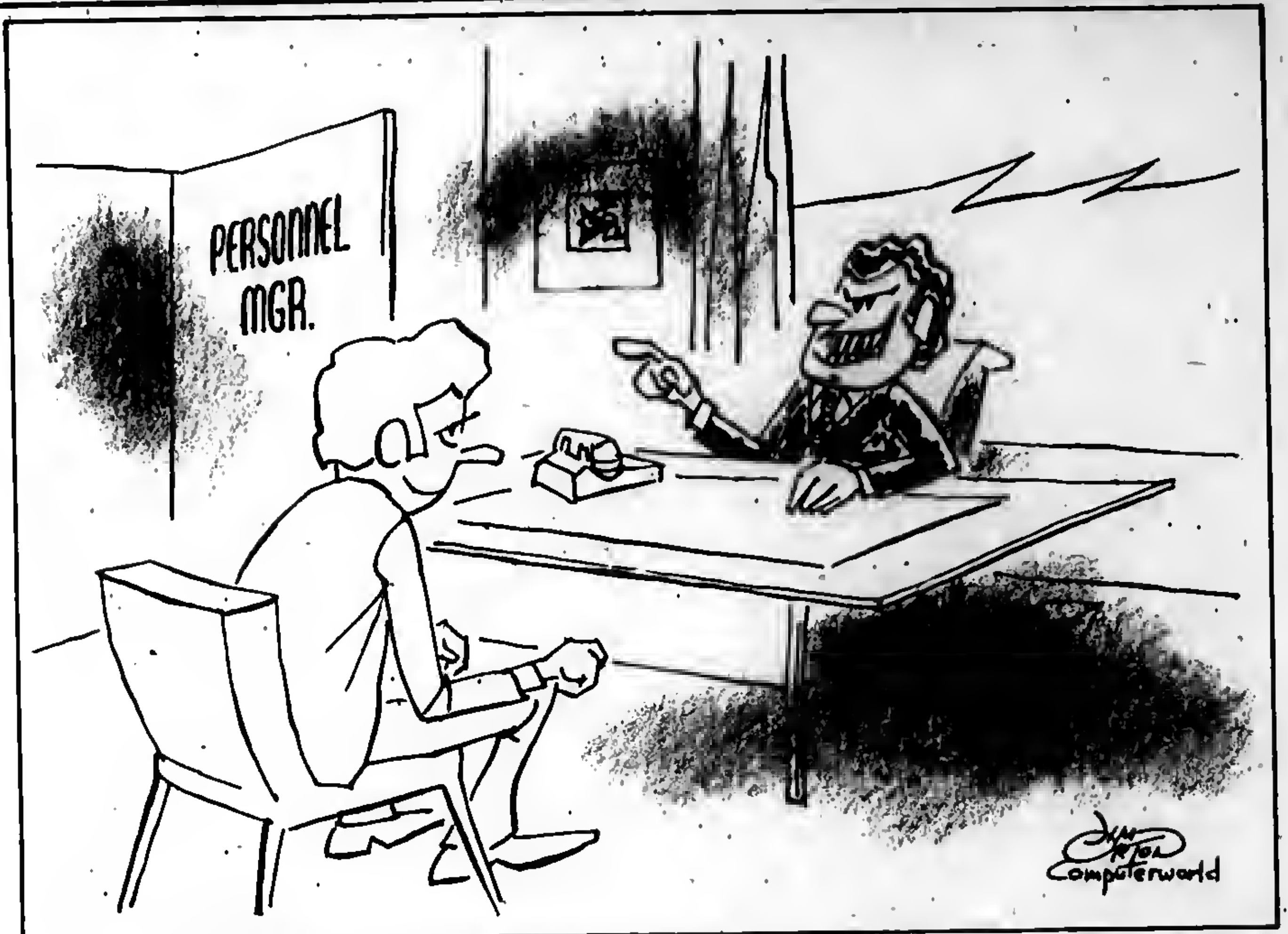
The computer industry has not been around for a long time, but it has certainly played an important part in the makeup of our society and its involvement increases every day.

As a vital part of the U.S. scene, it would be expected computers would have a significant niche at the Smithsonian Institution in Washington, D.C. It is at the Smithsonian that visitors to the Capitol get a shapshot of the U.S. arts, culture and industry.

Unfortunately the computer industry is represented by a relatively meager exhibit that contains vaguely labeled parts from the early Univac I and Whirlwind systems in addition to some military systems.

Certainly the computer deserves a better representation. There is no doubt our industry has changed the way our society works at basic chores. What would be wrong with showing the evolution of a payroll system from hand-written ledger to tab cards to optically scanned time cards that automatically print out paychecks?

There are many other examples which would graphically demonstrate the involvement of computers in our lives. The Smithsonian staff has shown its skill and creativity in other important areas which are represented with inspiring exhibitions. The role of the computer, even with its relatively short history, deserves a more definitive exhibit as soon as possible.



'You Say You've Worked on the Social Security SSI Program, and You Never Make the Same Mistake Twice? You're Hired!'

Letters to the Editor

Not All Univac 90/60 Conversions As Difficult as Reported by MAS

The article in the June 21 *Computerworld* about Medical Ancillary Services, Inc.'s (MAS) experience with its Univac 90/60 interested us as we have a 90/60 which was also installed in September of 1975. We are satisfied with our system and have not had anywhere near the problems MAS is having.

In August of 1974 we converted from an IBM 360/30 to an IBM 370/115. Any conversion is hard work and requires a supreme effort from all people involved. The above mentioned conversion was no exception. After two months of running on the 370/115, it was evident the machine was giving us no better results than our 360/30.

In October of 1974 we signed a contract with Univac for a 90/60 with an interim RCA Spectra 70. The Spectra 70 was considerably faster than the 370/115, but again, conversion took a lot of time even though we were emulating IBM DOS.

In June of 1975 conversion to the 90/60 was begun, with Univac giving us a lot of help. The 90/60 was installed in September and the Spectra was pulled out in November.

We are happy to report our conversion to the 90/60 was the easiest of the three conversions we have done in the past two years.

Since the 90/60 has been installed, our downtime has been 8% with the downtime for 1976 dropping to 4%.

The times we have encountered problems, Univac has done everything possible to get us up and running again.

We are seeing at least twice the performance and speed we had on the Spectra.

For what we do and want to do in the future, the 90/60 seems to be everything we were promised.

Wayne Malone
Manager

TEC Data Processing Center
Austin, Texas

CWIS Data Security Rigid

We at CWIS, Inc. were glad to see some recognition of the pioneering efforts being made by CWIS and others in developing a management information system for the social service area, particularly in child welfare [CW, June 7].

However, Michael R. Diem, formerly data processing director of CWIS, was incorrectly titled in the article. He is now coordinator of systems development for the New York State Department of Social Services, not for CWIS.

More importantly, the article left the impression there is little control over access to the data on the CWIS files. I would like to clarify this comment.

Besides a Confidentiality Committee (consisting of representatives of our Board of Directors) who regularly scrutinize our procedures, we have encoded the CWIS data in a way that would make it virtually impossible for anyone to decode the master files without knowledge of associated support files.

Physically we operate in a "closed shop" with dedicated hardware and software and with physical security considered rigid in this environment.

Robert C. Gundersen
Executive Director

CWIS
New York, N.Y.

(Other letters on Page 12.)

Data Past

Eight Years Ago
July 24, 1968

DAYTON, Ohio – NCR Corp. became the first mainframe manufacturer to enter the computer software market when it concluded a special marketing agreement with National Computer Analysts (NCA) which gave NCR exclusive marketing rights to NCA's Quick-Draw program.

– – –

NEW YORK – The McCall Corp. asked the Federal Communications Commission (FCC) to set aside for McCall one of the channels in Comsat's proposed domestic earth satellite. The magazine publisher's plan for use of the satellite links was low-cost data transmission for a national network of regional service bureaus as well as transmission of material for McCall's publications and for television programs.

Five Years Ago
July 28, 1971

WASHINGTON, D.C. – The National Association of Regulatory Utility Commissioners (Naruc) petitioned the Federal Communications Commission (FCC) to reconsider the FCC ruling in favor of free competition to the Bell System provided by the specialized common carriers. Competition would benefit only a small number of affluent business users, Naruc said.

– – –

UPPER ARLINGTON, Ohio – Residents here were scheduled to be subjected to a six-month test of electronic funds transfer (EFT) to probe the economic, technological feasibility of such a system. The test was sponsored by City National Bank and Trust Co. of Columbus, Ohio and National BankAmericard, Inc.

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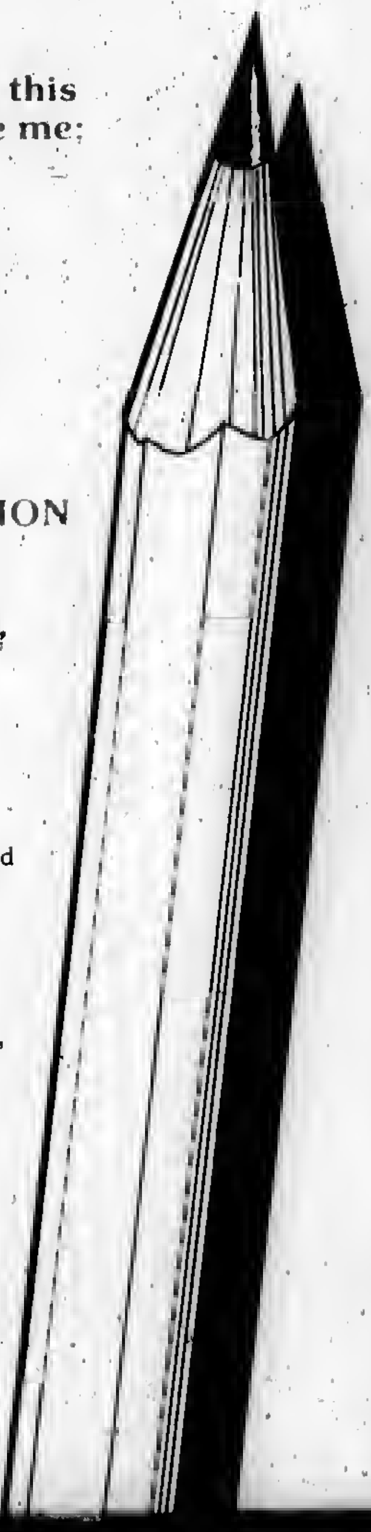

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When Implementing Techniques

Systems Analysts Face Many Types of Resistance

Special to Computerworld

Systems analysts, which include operations research specialists, planners and other staff-type people, are agents of change. As such, they are frequently confronted with the problem of implementing new techniques in the face of various forms of resistance.

This situation presents a unique opportunity to observe individual reactions to pressure. During the past few years, we have had the benefit of Transactional Analysis, The Peter Principle and other published observations that provided a sound basis for research.

As a result of this research it was possible to identify and classify certain types of managers and workers in both the user and DP organizations of a company.

- *The Fakir.* The Fakir is so named because of his "letting out the rope" technique. The Fakir does not want to appear uncooperative so he will answer every question raised by a systems analyst.

His answers are, however, designed to respond exactly to what was asked without volunteering anything else, in the hope the analysis will fail because of incomplete information.

- *The Diplomat.* The Diplomat likes and praises every new idea, but never seems to use them. They are "filed" until brought to his attention again (he hopes this won't happen). If forced to implement a new idea, he will assign his least competent employee and blame the failure on the new concept.

- *The Ostrich.* With his head buried in a pile of papers resulting from his inability to delegate work, the ostrich's response to change is to claim he is already too busy to try anything new.

- *The Historian.* The Historian's standard response to any proposal is, "We tried that back in 1949 and it didn't work."

- *The Politician.* The Politician is characterized by a complete knowledge of the informal relationships in the organization and a mental map of where all the bodies are buried. He comes to meetings completely unprepared, depending on his oratorical ability to appear to be contributing. He can be an asset to the systems analyst in the right circumstances (just make sure there's something in it for him).

- *Charlie Brown.* Everything bad happens to this "good guy." He is the unfortunate plaything of the fates. He can be a walking invitation to disaster on a project because his masochistic unconscious deliberately sets traps for him.

- *The Neanderthal.* "This stone ax works best because I know how to use it, and I learned how to use it because it works best." The Neanderthal is characterized by his attachment to primitive methods and a complete inability to cope with change. '

- *The Dogfighter.* Short on ideas and ingenuity, the Dogfighter pits his subordinates against each other, rewards the winner and uses the winner's ideas.

- *The Broad Jumper.* This is usually a male (but there are female counterparts) who entertains or distracts his coworkers with real or imagined tales of his sexual adventures. He is extremely insecure and an inferior performer on the job. His technique is designed to slow down everyone else so his lack of performance will not be noticeable.

- *The Adumbrator.* High on the organizational ladder, the Adumbrator is "above" answering the analyst's detailed questions. He will send the analyst to see someone "more appropriate" (i.e., lower in organization) to get the answers. This will, of course, disguise the fact he doesn't know.

- *The Catatonic.* The most hopeless of all, the Catatonic seems to go through programmed motions in his sleep. He is really off in his own dream world and doesn't want reality to interfere with it.

- *Leonardo Da Vinci.* This systems analyst either can do or has done everything. Unfortunately, the technology often did not exist to implement his revolutionary concepts. As a result, he is singularly unsuccessful at implementing new systems.

- *Einstein.* Probably further ahead of has time than Da Vinci, Einstein deals in theory alone. Others may prove or disprove his general theories of systems relativity while he goes on to grander thoughts. He has never implemented a system.

Reader Commentary

- *The Pressure Cooker.* Usually to be found in the systems or programming group, he thrives on pressure. If it doesn't exist, he will create it by waiting until the last minute to do his thing.

- *Sgt. Preston of the Yukon.* This heroic systems analyst or programmer always solves the key problem in the nick of time. Usually it's a problem *he* created through an oversight (unconsciously motivated by his desire to be a hero).

- *The Egotist.* Flattery will get you almost anything with this one. He is so inflated with his importance that he will believe the most atrocious praise of his skills, perspicacity and capability.

- *The Gossip.* Stay on the good side of the Gossip, if you can! He rarely gets any work done because work interferes with concentrating on the rumor mill and the underground news pipeline.

- *The Turtle.* Once upon a time the Turtle had the capacity to learn. He used it up in learning how to operate within the one organization in which he has made his career. He has pulled his head into his shell and is not aware of the accomplishments of competition or industry trends, but the legs keep right on propelling him forward.

- *The Robot.* This supervisor follows the rules and will not make any decisions not clearly defined by company policies and procedures. This approach saves him from really thinking and provides an excellent defense if anything should go wrong.

- *The Butterfly.* In many ways The Butterfly is the opposite of the Robot. He will never fly a straight path if a crooked one is available. For him, the rules were meant to be broken. He depends on the beauty of his personality to rescue him from disaster. If you want to get something done quickly, and if you are willing to accept the risk (because he will pass any blame on to you), call on the Butterfly for help.

- *The Yardstick.* This supervisor uses himself to measure all employees under him. Woe betide anyone who appears to exceed him in intelligence, creativity or skill. This supervisor can create a continual turnover of systems analysts until he is sure all threats are removed.

- *The Siamese Fighting Fish (SFF).* This syndrome is found at many levels of the organization It represents the extreme development of territoriality. The SFF will fight to the death an attempt to encroach on his area. Those of the species that survive are usually found in the more stagnant backwaters of organizations that change slowly.

- *The Near-Sighted Night-Walker (NSNW).* This manager is so interested in short-term results he keeps himself completely in the dark regarding long-term plans or goals. If a solution takes more than one month or does not have an immediate payback, he can't see it.

- *Programmer.* A member of an esoteric cult that worships the 3-1/2-headed goddess_ Erroneous, whose heads are named Input, Output and JCL (the half head is named Core Dump). They maintain a complex, love/hate, symbiotic relationship with systems analysts. They are usually held responsible for anything that goes wrong with a system.

Continued research will result in other characterizations that may be of help in identifying individual types. There is at least some hope that the next few years will witness the development of a taxonomy for the field.

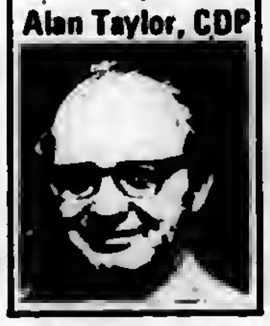
Reviewing Contracts Job of Both Lawyer, Technician

Eugene Rochette had checks totaling $25,500 bounced in 1974 by the computer at his bank. He went bankrupt, sued and recovered more than 11 times the amount involved. True, this was in France; but similar happenings were going on in this country.

The Taylor Report

By

Alan Taylor, CDP



For instance, Patricia Rau, who had been erroneously charged four monthly bank service charges of around $200 each, also in 1974, was awarded $8,700 – about 10 times the amount involved – in Denver, Colo.

In the Rau case, it wasn't that the bank concerned, the Guaranty Bank of Stapleton, Colo., hadn't admitted its errors. The service charges, after being erroneously computed, were remitted each month after complaints were made.

But in the meantime Rau's checks were bouncing. Rau's landlord evicted her after the fourth month of bouncing rent checks.

These two, almost simultaneous reports from thousands of miles apart bring into focus the changes that have occurred in computer liability questions during the past few years. They also suggest the time is ripe to review current procedures involved in computer contracts to see if they have kept up with the times.

During the past few years the computer contract boiler plate has been tightened up by many computer suppliers. Typical clauses now disown even the most formal printed specifications, commitments and promises, while at the same time restricting the liability of the computer supplier for anything to negligible amounts.

This seems to cover everything from sending incompetent servicemen to service the equipment or supplying software with known errors to deliberately trying to conceal the real causes of computer problems by putting the blame on the user himself.

Together, these two all-too-typical clauses (the entire-agreement and liability limitation clauses) make it seem quite certain the computer user will be the one who has to pay for any mistakes, whether or not they are his fault. Once, perhaps, this was OK; but if awards in computer cases are going to rise, as they have in medical malpractice cases, the situation should be reviewed.

The basic problem for computer technicians with entire-agreement clauses is that technicians don't like fictions – legal or otherwise. Of course, the companies know these clauses are hard for technicians to deal with rationally.

How a technician should balance these "promises" in the light of these entire-agreement clauses is something not taught in any of the courses he has attended. So what now happens is he washes his hands of it and refers the matter to the lawyers. Generally, that is the last he knows of it.

The arrival of the contract form on the lawyer's desk therefore is remarkably naked. There is little technical review of implications of the contract terms.

No technical report saying "If the firm supplies wrong software, hundreds of our depositors could have their accounts screwed up, and we might take months to clean the mess up."

Perhaps he should make such a report to the attorney. I think he should. I know ordinary business contracts arrive on attorney's desks equally naked and seem to get dealt with satisfactorily. But lawyers are, by and large, accustomed to business matters. They are, in their own way, businessmen themselves.

But few lawyers are, in any sense, computer people. Not sending them reviews of what is the apparent result of the contract terms – no matter how unbelievable – is simply not giving them a fair shake.

Equally, the search for some alternative is primarily a technical task. If court awards are going to take into account things like the consequential damage of going bankrupt or being evicted from your apartment, alternative sources of computers may be needed. What would you do if the lawyer turned down the contract terms as being dangerous? Go back to green eyeshades and abandon computers? I don't think so.

There are many ways nowadays to obtain data processing power other than the state-of-the-art in-house computer. Older systems with stable software, independently available maintenance, etc. may offer good alternatives. Time-sharing, packet-switching, use of standard languages, etc. all provide most of the same advantages, although the economics when things go well are rarely as good.

But they are alternatives to be considered. And the attorney should be informed about the alternative situation also.

This list of technical actions is not exhaustive. Systems people, like drivers, can practice defensive decision making. A system put on a computer where the supplier takes no responsibility can be replaced by a double-checking system. A redundant schedule, with a different job mix, may permit the user to control his situation to avoid really dangerous situations. There are, in fact, many alternatives that have so far been neglected.

This neglect should not continue. In the light of computer errors generating larger and larger awards (and more and more law cases), the contract-reviewing procedure should become a joint technical/legal operation, not just left to an uninformed lawyer.

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Blame for Steve Karagianis' Death on Our Shoulders

...And in This Corner

By Kenniston W. Lord Jr.
Special to Computerworld

It seemed like such a simple and harmless procedure in the old days. All one had to do was to detect a punch at 12-time and another at 4-time in column 1 and then the next card, a master record, could be selected into a separate pocket.

The computer permitted us to do the same; the procedure was essentially the same. As time went on, the procedure became more sophisticated, but the results remained.

We learned to match a card against a tape and to not copy the old master to the new master. When we got onto disk, we merely flagged the record or broke the chain.

Just a simple and harmless procedure, right? Wrong.

For Steve Karagianis, it meant death.

It wasn't a code which killed Karagianis [CW, May 17], although a mandatory design standard could have forced the systems designers to spell the message out.

It wasn't a lack of operator training, although such training could easily have prevented his death.

It wasn't even the existence of a National Crime Information Center record which killed him, although such a record should not have been in existence.

No, what killed Karagianis was a simple oversight – the lack of the ability of a multibillion dollar industry to get its act together and come to grips with the social monster it has created. And for that we – you and I – must eccept responsibility for the death of the young Yonkers gentleman.

Is that hard to accept? Can you live with it? How? You are responsible for the death of Steven Karagianis! And so am I.

You are responsible because you have so easily dismissed his suicide as the act of an unstable young man.

You are responsible for his death because you are convinced that such things happen only to "other people."

You are responsible for his death because the only commitment you have made is to the monthly meeting of the Data Processing Chowder and Marching Society, if that.

You are responsible because you somehow feel DP errors are more funny than tragic. But you're responsible nonetheless.

And I am responsible, for I have seen the light. Before any of you get your jollies out of that statement, I must point out such concerns have been on my mind, in my writings, in my speeches and in my presentations ever since 1972.

I'm responsible because, having seen the light, I have not been persuasive enough to convey the message of those concerns in terms you can understand, for my visions are not of larger mainframes, more sophisticated software or the trivia of an Association for Computing Machinery election.

I'm responsible because I've not been successful in persuading the powers that be of the *existence* of the problem, much less the nature and magnitude of it.

The potential for dealing death by computer is limitless. We've now killed Frank Booth and Steve Karagianis. How many more must die before we awaken to the problem?

How many more times must a simple file deletion (or lack of it) result in the physical expiration of the data subject? Who will speak for them?

I must. And you can castigate me all you like – but, at the same time, recognize you must also shoulder some of the responsibility.

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Reader Commentary

By Nor Jones
Special to Computerworld

In the 18 years I have spent in this crazy business, the dominant question has remained the same: How can we determine who can produce a workable system?

As Robert Huskins put it in his letter [CW, May 24], "We of the data processing profession have cried for years for a tool by which we could measure the technical abilities of computer programming and software people."

In an effort to find and train people who can produce workable systems, we have tried programmer aptitude tests, certification tests, courses in computer languages, courses in concepts of structured programming, documentation, systems analysis and design theory, etc.

Yet today the percentage of workable systems produced per man-hour is no greater than it was 10 years ago – and it may be less. Why?

I think that if there is an answer to Huskins, we are not finding it because we are not looking in the right place. I have found we can often understand a problem easier if we reduce our emotional loadings by using analogics.

Let us shift our focus to a companion field that has a similar problem – the English language and its literature. Few of us, who have spent years directly and indirectly learning English, would claim to be recognized authorities on English and its literature. Normally in our society one must obtain a college degree, particularly a high-level one, to be considered an authority on this subject.

Now let us shift our focus to the English literature itself. If one examines the books, particularly the nontechnical ones, published in any given year, one will find very few produced by people with degrees in English and/or English literature.

The people who are recognized authorities on English literature seldom publish.

It would appear, then, that there is little correlation between the ability to obtain knowledge of literature and the ability to write it.

Now let us return to DP. If Cobol, Fortran and other computer languages and computer control procedures were taught in our public schools from the first grade on, as is English, we would find that no more people would be able to write workable computer-based systems than can write literature.

The key words in this dilemma are the "ability to do" as opposed to "knowledge of or about." We are faced with the fact that the only known means of testing for an ability or skill is by having the person exercise that skill.

If I am right, the tool to test the ability of computer programming and systems people will never be found in the areas of academic degrees or certification programs.

Until we recognize the fact that there is little or no correlation between knowledge of a subject and skill in performing the subject, we will never find a tool to uncover those with the desired skill.

Jones is with Nor Jones & Associates in Little Rock, Ark.

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Letters to the Editor

Government Formula Based on Net Present Value

In the June 7 article, "Using Government Formula Helps Dealers Set Prices," wouldn't it have been simpler to say the government uses the net present value (NPV) of a bid to determine its bottom-line cost, rather than outlining an undergraduate textbook example of how to avoid the concept of an annuity?

Those so-called "adjustment factors" were simply the present values of one dollar the given number of years in the future, compounding at the annual rate of 10%. These factors are arrived at by applying the following formula:

$$\text{factor} = (1.0 + i)^{-n}$$

where:

i = annual compounding rate (10% in the examples)

n = number of years

A much simpler technique than adding the present values of each of a series of compounded sums, as the article did, would be to calculate the NPV of the annuity of monthly payments (which, by definition, is exactly the same) using the formula:

$$NPV = (\text{Annual payment}) \times ((1.0 - (1.0 + i)^{-n})/i)$$

The entire "government formula" can be restated in the following formula:

$$BLC = FEC + NPV - 0.2 \times FEC \times (1.0 + i)^{-n}$$

where:

BLC = Botton-line cost

FEC = Front-end cost, i.e., any one-time/first-time cost such as purchase price or front money

Paul B. Landfair

Newport Beach, Calif.

Financially Incompetent

The June 7 article entitled "Using Government Formula Helps Dealers Set Prices" described certain government evaluation criteria for selecting among various lease/purchase options.

To state the article was misleading as it is costly to anyone who attempts to use it would be an extreme understatement as it demonstrates that government bureaucrats are as incompetent in financial evaluations as is the average computer facilities manager.

The basic fallacy in the article was in assuming that the present-value (PV) method of evaluating capital expenditures is applicable to nonprofit organizations; for the method assumes the capital expended during a time period will be used to produce income at a rate higher than that which it will cost to borrow it (this is called leverage).

Obviously this implies that present dollars (invested in the enterprise) are more valuable than future dollars (coming from sources outside the enterprise).

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Blame for Steve Karagianis' Death on Our Shoulders

By Kenniston W. Lord Jr.

Special to Computerworld

It seemed like such a simple and harmless procedure in the old days. All one had to do was to detect a punch at 12-time and another at 4-time in column 1 and then the next card, a master record, could be selected into a separate pocket.

The computer permitted us to do the same; the procedure was essentially the same. As time went on, the procedure became more sophisticated, but the results remained.

We learned to match a card against a tape and to not copy the old master to the new master. When we got onto disk, we merely flagged the record or broke the chain.

Just a simple and harmless procedure, right? Wrong.

For Steve Karagianis, it meant death.

It wasn't a code which killed Karagianis [CW, May 17], although a mandatory design standard could have forced the systems designers to spell the message out.

It wasn't a lack of operator training, although such training could easily have prevented his death.

It wasn't even the existence of a National Crime Information Center record which killed him, although such a record should not have been in existence.

No, what killed Karagianis was a simple oversight – the lack of the ability of a multibillion dollar industry to get its act together and come to grips with the social monster it has created. And for that we – you and I – must accept responsibility for the death of the young Yonkers gentleman.

Is that hard to accept? Can you live with it? How? You are responsible for the death of Steven Karagianis! And so am I.

You are responsible because you have so easily dismissed his suicide as the act of an unstable young man.

You are responsible for his death because you are convinced that such things happen only to "other people."

You are responsihle for his death because the only commitment you have made is to the monthly meeting of the Data Processing Chowder and Marching Society, if that.

You are responsible because you somehow feel DP errors are more funny than tragic. But you're responsible nonetheless.

And I am responsible, for I have seen the light. Before any of you get your jollies out of that statement, I must point out such concerns have been on my mind, in my writings, in my speeches and in my presentations ever since 1972.

I'm responsible because, having seen the light, I have not been persuasive enough to convey the message of those concerns in terms you can understand, for my visions are not of larger mainframes, more sophisticated software or the trivia of an Association for Computing Machinery election.

...And in This Corner

I'm responsible because I've not been successful in persuading the powers that be of the *existence* of the problem, much less the nature and magnitude of it.

The potential for dealing death by computer is limitless. We've now killed Frank Booth and Steve Karagianis. How many more must die before we awaken to the problem?

How many more times must a simple file deletion (or lack of it) result in the physical expiration of the data subject? Who will speak for them?

I must. And you can castigate me all you like – but, at the same time, recognize you must also shoulder some of the responsibility.

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Certification Valid Only to Test Knowledge, Not Skill or Ability

By Nor Jones

Special to Computerworld

In the 18 years I have spent in this crazy business, the dominant question has remained the same: How can we determine who can produce a workable system?

As Robert Huskins put it in his letter [CW, May 24], "We of the data processing profession have cried for years for a tool by which we could measure the technical abilities of computer programming and software people."

In an effort to find and train people who can produce workable systems, we have tried programmer aptitude tests, certification tests, courses in computer languages, courses in concepts of structured programming, documentation, systems analysis and design theory, etc.

Yet today the percentage of workable systems produced per man-hour is no greater than it was 10 years ago – and it may be less. Why?

I think that if there is an answer to Huskins, we are not finding it because we are not looking in the right place. I have found we can often understand a problem easier if we reduce our emotional loadings by using analogics.

Let us shift our focus to a companion field that has a similar problem – the English language and its literature. Few of us, who have spent years directly and indirectly learning English, would claim to be recognized authorities on English and its literature. Normally in our society one must obtain a college degree, particularly a high-level one, to be considered an authority on this subject.

Now let us shift our focus to the English literature itself. If one examines the books, particularly the nontechnical ones, published in any given year, one will find very few produced by people with degrees in English and/or English literature.

The people who are recognized authorities on English literature seldom publish.

It would appear, then, that there is little correlation between the ability to obtain knowledge of literature and the ability to write it.

Reader Commentary

Now let us return to DP. If Cobol, Fortran and other computer languages and computer control procedures were taught in our public schools from the first grade on, as is English, we would find that no more people would be able to write workable computer-based systems than can write literature.

The key words in this dilemma are the "ahility to do" as opposed to "knowledge of or about." We are faced with the fact that the only known means of testing for an ability or skill is hy having the person exercise that skill.

If I am right, the tool to test the ability of computer programming and systems people will never be found in the areas of academic degrees or certification programs.

Until we recognize the fact that there is little or no correlation between knowledge of a subject and skill in performing the subject, we will never find a tool to uncover those with the desired skill.

Jones is with Nor Jones & Associates in Little Rock, Ark.

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Letters to the Editor

Government Formula Based on Net Present Value

In the June 7 article, "Using Government Formula Helps Dealers Set Prices," wouldn't it have been simpler to say the government uses the net present value (NPV) of a bid to determine its bottom-line cost, rather than outlining an undergraduate textbook example of how to avoid the concept of an annuity?

Those so-called "adjustment factors" were simply the present values of one dollar the given number of years in the future, compounding at the annual rate of 10%. These factors are arrived at by applying the following formula:

$$\text{factor} = (1.0 + i)^{-n}$$

where:
i = annual compounding rate (10% in the examples)
n = number of years

A much simpler technique than adding the present values of each of a series of compounded sums, as the article did, would be to calculate the NPV of the annuity of monthly payments (which, by definition, is exactly the same) using the formula:

$\text{NPV} = (\text{Annual payment}) \times$
$((1.0 - (1.0 + i)^{-n})/i)$

The entire "government formula" can be restated in the following formula:

$\text{BLC} = \text{FEC} + \text{NPV} - 0.2 \times$
$\text{FEC} \times (1.0 + i)^{-n}$

where:
BLC = Botton-line cost
FEC = Front-end cost, i.e., any one-time/first-time cost such as purchase price or front money

Paul B. Landfair
Newport Beach, Calif.

Financially Incompetent

The June 7 article entitled "Using Government Formula Helps Dealers Set Prices" described certain government evaluation criteria for selecting among various lease/purchase options.

To state the article was misleading and costly to anyone who attempts to use it would be an extreme understatement and demonstrates that government bureaucrats are as incompetent in financial evaluations as is the average computer facilities manager.

The basic fallacy in the article was assuming that the present-value (PV) method of evaluating capital expenditures is applicable to nonprofit organizations; for the method assumes the capital expended during a time period will be used to produce income at a rate higher than that which it will cost to borrow it (this is called leverage).

Obviously this implies that present dollars (invested in the enterprise) are more valuable than future dollars (coming from sources outside the enterprise).

Since the government is not in the business of making profit, its internal rate of return must be negative (which is obviously meaningless). Further, if any criteria is to be used to evaluate an option (other than looking at costs in terms of absolute dollars), the most obvious criteria would be to assume a compounded (rather than an inverse compounded) criteria; for the value of future dollars will actually be greater than that of present dollars for a governmental agency.

This approach, although seemingly contrary to common sense, is founded on the fact that inflation will cause the individual valuation of future dollars to shrink; but since the tax base supporting the agency will grow, the agency can "afford" to spend more dollars on future projects and still retain the same "proportion to budget."

As for the private sector, the simplistic approach described (viz. taking the PV of cash outflow) was naive and bordered on the incompetent.

A simple approach to financial decision making is often a dangerous one. Thus, an individual who does not have an extensive background in finance should leave financial decisions of this nature to an expert in the field or a program which has been designed by an expert.

Jerome G. Ganci
Woodside, N.Y.

Not Worth the Fuss

Regarding all the commotion about female or male programmers pictured in ads in *Computerworld*, is it really worth all the fuss? I thought we were all professional people working side by side. Data processing is a tough enough mother without hassles between its children! Grow up out there!

Jean Sisson
Buffalo, N.Y.

On Discrimination

Regarding Frank K. Binder's letter [CW, June 7], discrimination by the computer industry against women *is* blatant and subtle – blatant to women (and a few aware men), subtle or even nonexistent to most men.

My supervisor is a computer specialist. Surprisingly enough, this is not an Equal Employment Opportunity (EEO)-developed term designed to entitle women with no specific qualifications. My supervisor's job comprises that of systems analyst, programmer, DP public relations man and occasionally he is an operator.

What the hell has physical strength to do with programmers – male or female? After 17 years of lugging forms boxes around, do well-developed biceps entitle one to a status above that of a nonlugger female?

K. Spiegelberg
Orofino, Idaho

PL/I Converts Overzealous

I wonder whether there's something inherent in the nature of PL/I that attracts converts with the fervor of old-style evangelists?

I don't particularly disagree with Tom McSloy [CW, May 31] about the advantages of PL/I over Cobol for structured programming, but why get so excited? My management wants Cobol and structured programming, and we've been doing both together successfully.

I do want to take issue with a couple of McSloy's technical points, however. First, Cobol does have a facility for isolating substrings without defining the string as a single-character array. It's called UNSTRING. (The corresponding string concatenation feature is called STRING.) See Ansi Standard X3.23-1974, sections 5.19 and 5.21.

Secondly, why define anything in Cobol as "hex 80"? Sounds like overdependence on one of the vendors to me.

T. Jeff Byrum
New York, N.Y.

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SOFTWARE&SERVICES

Planning, Commitment Seen Keys to Good DBMS

By Don Leavitt
Of the CW Staff

CINCINNATI – Although data base management systems (DBMS) differ from one another in many respects, there is a general pattern of things to do to begin working with any of them, according to the data base administrator for Rand McNally & Co.

An orderly approach will work, however, only if the installation understands the DBMS "physically and logically," has developed long-range data base plans and has made the commitment to see them through, Gail V. Kellogg told a meeting of Total DBMS users held here recently.

The system understanding can come from a combination of vendor classes, on-site vendor support, study of system manuals and attendance at user group meetings, she said.

The company commitment is often indicated by assignment of people to the data base administration function to support the integration of related application systems, Kellogg continued.

Headquartered in Skokie, Ill., Rand McNally has a 768K IBM 360/65 with 10 3330-type disk drives, a dozen tape drives and "20 to 32" locally-attached IBM 3270 CRT terminals.

Software includes Computer Software Co.'s Extended DOS (Edos) supporting six partitions, Turnkey Systems' Taskmaster teleprocessing monitor and Cincom Systems' Total/7, which was installed in October 1974.

The initial application of the DBMS, for order entry and processing, went operational in November 1975. Integrated inventory accounting and control is currently under development and accounts receivable will be the next target area, Kellogg said.

The "mechanics" of defining the long-range data base plans may include user interviews but definitely requires a review of the internals of the actual data processing itself, she said.

The user interviews may be appropriate to identify potential projects and to pinpoint parts of existing systems that might be better integrated, she noted.

The internal review should lead to the drawing of a data base "schematic" that represents general types of data – those already in use and those foreseen as needed – and their relationships to each other. Only after that can the user effectively concentrate on the initial applications, Kellogg said.

Working on the detailed data base file and record design must lead to a whole series of considerations, she added. A study of the basic master-variable relationships should help to identify the basic link paths, while consideration of on-line accessibility will help to locate secondary paths, she explained.

Consideration of processing time can lead to an awareness of the trade-offs that must be made in setting up any system.

At this point in her presentation, Kellogg interjected a "word about hierarchies and networks" since the meaning of these buzzwords often seems to be blurred in people's minds.

She noted, for example, that Total's design "implies a network" approach, but "many relationships are logically hierarchies."

In fact, she added, a Total network – with links between master and variable files – allows for "an infinite number" of levels of hierarchy.

"The master file contains all levels of the hierarchy while the variable file identifies the full range of relationships that may exist at a given time," she explained.

Random Notes

Writing Chores Handled By Sysdoc's 'Docu-Squads'

NEW YORK – Claiming to have assembled "a diverse group of professional writers [with] experience in programming, systems analysis, operations and project management," Sysdoc, Inc. has organized "Flying Docu-Squads" to prepare systems manuals, operations forms, clerical instructions or whatever other documentation is necessary at a user site.

Sysdoc, Inc. is at 182 Sullivan St., New York, N.Y. 10012.

Fortran Routines Offered for Nova

MANLIUS, N.Y. – Commercial subroutines to extend the use of Fortran into business-oriented areas are available now for Data General Nova users from Manlius Valley Enterprises, Inc. (MVE).

Adapted from the Ideal subroutine package originally put together by IBM for the 1130, the MVE package has routines covering input/output, A1 array manipulation, format conversion, double integer arithmetic, real functions and numeric conversion, MVE claimed.

Object code on paper tape or floppy disk is available for $1,000, the vendor said, and can be ordered through P.O. Box 232, Manlius, N.Y. 13104.

NDC Linked to BankAmericard

ATLANTA – National Data Corp. (NDC) has completed a computer-to-computer interface with National BankAmericard's Base I system.

This linkage will now allow NDC to offer its credit-card authorization system to banks participating in the BankAmericard program, a spokesman explained.

NDC's credit-card authorization system, developed in 1969, already services over 50% of the Master Charge banks as well as a variety of other customers, he added.

NDC is at One National Data Plaza, Corporate Sq., Atlanta, Ga. 30329.

Regrouping of Application Areas Marks Latest Software Directory

CARMEL, Ind. – Like so many of the packages it lists, the latest *ICP Software Directory*, published this month by International Computer Programs, Inc. (ICP), is described as an enhanced version of a product that has been around for years.

The directory first appeared as the *ICP Quarterly* – "a catalog of salable computer software" – 10 years ago. Its purpose was and still is to provide a central listing of software that is generalized enough to be transportable from a vendor to a user site.

ICP encourages vendors or developers to list their products without cost and essentially without restriction on what they can say about their products.

Within the directory, which is sold on a yearly subscription basis, the products are organized into classifications for ease of comparison.

Now a semiannual publication, the January 1976 edition contained more than 3,600 proprietary products and data services. The current issue includes roughly the same number, but has restructured the classifications and made an effort to include more products from minicomputer software vendors and from remote-computing services.

The first volume of the two-book set is devoted to products directly in support of the DP operations themselves – the classic systems and utilities classifications – but now includes data base management and other methodologies that didn't really exist when the *Quarterly* was first published.

Much of the second volume has been reorganized because ICP realized many accounting and financial reporting packages and general administrative and planning products can be applied across industry lines. Packages that are limited to particular business are still listed, but in the second half of the book.

While the tables of contents point readers to specific classifications, the index at the back of each volume shows where each package is listed by name. As modified in January, this index also shows on what equipment each package has been implemented.

The *ICP Software Directory* is available for $100/year which covers the two editions and telephone consulting support. The publisher is at 1119 Keynote Way, Carmel, Ind. 46032.

'Vserv' Cuts Disk Space Waste

NORTH HOLLYWOOD, Calif. – Described as a tool for identifying wasted disk space and allowing more efficient space allocation in IBM DOS or DOS/VS environments, Vserv is a "volume table of contents (Vtoc) service utility" now available from Occidental Computer Systems, Inc. (OCS).

Vserv solves the disk management problems encountered in most DOS and DOS/VS installations by providing management with a comprehensive device mapping facility and Vtoc access capabilities, OCS said.

Vtoc manipulation commands supported by Vserv allow the user to graphically display a pack map and create, delete, update or rename a Format-1 label for a file, a spokesman noted.

The ability to truncate one or more files to the last used track is also part of the package. These Vserv options allow management to take direct action to solve underutilized space and overallocated file problems, he added.

Vserv is provided with a Genserv macro that allows the user to tailor his Vserv operation to defaults and security checking. Security checking is through the UPSI or SYSPARM fields of the supervisor and provides safety against unauthorized use of the commands, OCS said.

Vserv consists of a 15K program and a B transient. Vserv reads the Vtoc, sorts it in core and prints the pack map; this shows free spaces and provides a pack usage summary, displays end-of-file addresses, recognizes system files and libraries and flags data secured and expired files, according to the vendor.

In execution, Vserv provides device independence, a fast in-core sort, automatic volume recognition, dynamic assignments and multiple volumes per run, OCS added.

Vserv is available on a 30-day trial. The user guide is self-generated by the Genserv macro and the system is provided on magnetic tape.

Vserv is available for a one-time purchase price of $400. The vendor is at 10202 Riverside Drive, North Hollywood, Calif. 91602.

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'On-Line Processing' Gives Bank Interface Choices

NAPERVILLE, Ill. – The On-Line Processing System for banks, recently introduced by Bob White Computing & Software, Inc. (BWCS), is available with a CICS interface; it can also function in tandem with a mini-driven front-end processor or in stand-alone mode under Btam, the vendor said.

The system is said to support a range of teller terminals, including IBM and NCR units, as well as CRT devices and voice response operations.

It is currently functioning in IBM DOS and DOS/VS environments; an OS version is expected in the fall.

Application modules currently available include on-line passbook savings, both savings and checking account inquiry and memo update, as well as installment loan inquiry, file maintenance and monetary transaction capture.

Support for inquiry into and updating of a Central Index File and "normal" teller functions such as issuing a cashier's check is also available, BWCS said.

With this system, there is no need to replace existing batch application systems, the vendor claimed, indicating the on-line logic can be easily adapted to a user's software and to different types of teller terminals.

The system can be used with multibank, multibranch operations and provides security at employee, transaction, terminal and account levels, according to the vendor.

It supports unlimited no-book transaction handling and permits variable teller cutoff with "tomorrow's" transactions posted to tomorrow's file, a spokesman added.

The software is currently installed at user locations supporting NCR 270/279 and IBM 3600 teller terminals. It is functioning with IBM's CICS, Computer Information Management Co.'s Datacom monitor and as a stand-alone with a Periphonics T-Comm 7, BWCS said.

The system can be purchased for $35,000 but will be sold in separately priced modules beginning at $17,000. A lease plan is also available, the spokesman noted.

BWCS is at 830 Diane Lane, Naperville, Ill. 60540.

'MLX' Handles Mortgage Loan Accounts

ORLANDO, Fla. – The Mortgage Loan Extended (MLX) package from Florida Software Services, Inc. (FSS) administers mortgage loan accounts, keeps track of investors and participants in the bank's loans and copes with the government reporting requirements demanded of lending institutions, FSS said.

Written in Cobol and implemented on IBM, Burroughs or Honeywell equipment, MLX allows payments to be made on any day of the month or to be adjusted to suit both bank and client, according to the vendor.

The payment plan can be by receipt of a bill or coupon slip or through debiting to a checking or savings account, a spokesman added.

The system has the ability to calculate interest accrual for each loan based on a combination of alternative factors: scheduled or actual balance; interest in arrears or in advance; and a 360- or 365-day year.

For their parts, banks can offer clients interest earned from day of deposit to day of withdrawal on any or all escrow accounts, he noted.

MLX can deliver "complete detailed reports" as called for by the Home Mortgage Disclosure Act of 1975, FSS claimed.

Internally, the software is configured around a control file that contains more than 100 data elements which direct the overall system operation. There are also more than 130 data elements for each loan, FSS said.

The extent of information available on each loan supports independent handling of any loan customer, the vendor went on. Specifically, it places all accrual methods, interest calculations and payment options on the loan level rather than at the bank level, the spokesman emphasized.

This should provide the bank customer with a sense of personalized service without imposing a heavy clerical burden on the bank, as would be the case with a less comprehensive automated system, he said.

MLX can be acquired under license for $31,200; the vendor can be reached through P.O. Box 2269, Orlando, Fla. 32802.

Modeling System on T/S Network Eases Forecast, Planning Chores

VAN NUYS, Calif. – Executives of financial institutions can explore different tactics for budgeting, applying funds and managing sources of funds on a "what-if" basis with Bankmodel, an on-line modeling system implemented on the PCS/Computernet by Proprietary Computer Systems, Inc. (PCS).

Bankmodel uses balance sheet data to model the using institution's overall financial position and performance, PCS said; by inserting trial values in future pro forma balance sheets, users can forecast the impact of line item changes on bottom line results.

At budget time, use of an on-line system like this may cut months off the time needed to go through the cycles of proposal, analysis, coordination, adjustment and reproposal, the vendor said.

PCS is at 16625 Saticoy St., Van Nuys, Calif. 91406.

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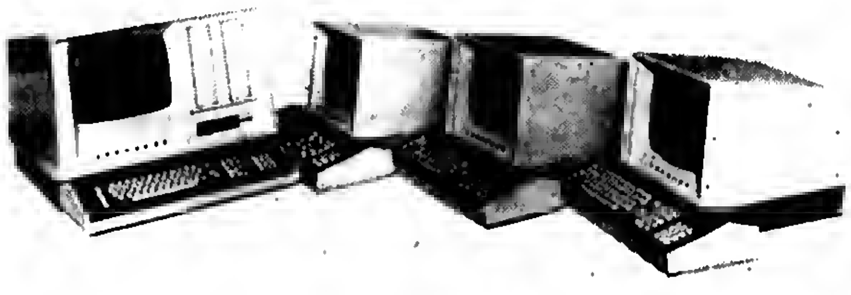

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Keeping Users in the Dark Defeats DP Center's Goal

By Jack L. Stone

Special to Computerworld

Peopleware

"Service to the users!" This slogan is now widely accepted as the primary charge of computer centers.

In the past, the slogan was correctly interpreted as providing an increasingly broad range of computing services with associated improvements in throughput and response time.

And yet, today, users – any people at least one step removed from day-to-day operations in the computer center – in many organizations are more dissatisfied than ever with the center.

Surface complaints relate to the familiar problems of bringing new applications to the system and resolving discrepancies in production runs. More importantly, I sense a groundswell of below-the-surface antagonism and hostility.

Users view the center as comprised of "technicians" who approach DP systems as technology "cultists," with little regard for the needs and goals of the users.

I believe the users, in effect, are suggesting the need for the practice of "egoless leadership" by center management [CW, July 19]. This group does, in fact, perform its *primary* mission well – getting the machines up, the applications on, the work out.

However, in its necessary preoccupation with this extremely difficult task, it does not apply the management energy and talent necessary to develop effective human relationships with the user population.

The key to these relationships lies in carefully designed and implemented programs of human communications between user and computer center personnel – at all levels, using all media – an area of endeavor that is virtually unknown to the industry.

The need for quality communications with users is universal. I have yet to discover a center whose external interface meets even minimally acceptable levels of performance.

"External interface" covers the total range of communications media supporting the center – meetings, announcements, briefings, user guides, systems documentation, production control personnel, user training, planning studies, technical manuals, etc.

Although information is distributed through most of these external channels in many centers, it often is tardy, misdirected or incomplete. Furthermore, such information frequently appears erroneous to users.

External communications must be viewed as another one of those many areas of center activity involving human roles which requires management attention, resource commitments and detailed plannning to achieve success.

As in other personnel projects, communications programs conceived in haste, supported half-heartedly or implemented on a piecemeal basis are almost always doomed to failure and may actually be counterproductive.

Put more positively: In addition to technical resources provided by the center, users require all necessary information, properly presented and on a timely basis, that will permit them to do their jobs at a high level of excellence. This includes information relating to center plans, operations and evaluation techniques.

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations and personnel management.

Selected letters will be published in Computerworld, *along with commentary by Stone, in a column beginning next month.*

Letters should not exceed 500 words and should include the name, title, organization and address of the sender for acknolwedgement purposes. This information will be treated as confidential and withheld from publication unless authorized for release by the sender.

Let me now interpret this guideline:

- *Users require all necessary information.* I submit centers must reconsider their internal priorities for resource allocation and take steps necessary to assure that users do, in fact, receive the information needed to perform their jobs properly.

The need for information to support users is obvious. The difficulty lies in implementation of management programs designed to make the information available at the time needed, with the accuracy required and in a style acceptable to the user.

- *Permit them to do their jobs at a high level of excellence.* Users, as professionals, believe they are competent to perform their jobs well if they have the tools and information required. Typically, they feel that only through participation with the center can they accept the style and perhaps the accuracy of information developed for them by the center.

It is well-known that participation by users in system design is essential for applications system success; I am suggesting that participation by user representatives in the design of computer center communications programs is essential for computer center acceptance.

- *Information relating to center plans, operations and evaluation techniques.* Typical information regarding plans includes projected short- and long-term modifications in hardware/software capabilities; analysis of the impact of such changes in major applications; computer center organization, operations, documentation, standards and external relations.

Typical information regarding operations includes system availability and turnaround time; contingency plans for production in the event of machine or program failure; notice of "bumping" due to higher priority jobs; and user guides with ironclad guarantees of accuracy, currency and completeness.

Typical information regarding evaluation techniques includes regularly scheduled meetings between appropriate levels of user and center organization to evaluate applications processing performance and take action as required.

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System Brought Up in Three Days

Bank Sets Eye on Future With Distributed Network

By John P. Hebert
Of the CW Staff

HARTFORD, Conn. – A large savings bank located here made an entire on-line teller terminal and communications system operational from the ground up in three days after being forced to upgrade from an interim system.

Society for Savings recognized a need to change the interim computer and communications terminal system in 1973 to be able to put on-line a number of future services it was planning, according to Andrew M. Vignola, vice-president of the bank's Information Systems Services Division.

The bank's management also recognized the bank would continue to expand in the future and decided to implement a modular computer and communications system built around the concept of distributed processing, Vignola said.

In order to make the management request a reality, the bank's employees and representatives from both Bunker Ramo Corp. (BR) and Burroughs Corp. worked steadily to dismantle two Honeywell 1250 central processors and 75 BR 1000 teller terminals, he said.

Beginning on a Thursday night last fall, the assembled workforce took the interim system out and, by Saturday night, installed 90 BR 2001 intelligent teller terminals, 27 additional Burroughs terminals and the supporting computer and communications system on which Society now relies for its on-line applications, according to Vignola, who added it was a "textbook conversion."

Standard Line Discipline

To accomplish the task enabling different manufacturers' terminals to communicate with the bank's present Burroughs B3772 primary and backup processors and Burroughs B 774 front-end processor, the bank designed the network to deal with a standard line discipline, Vignola said.

The chosen discipline was Burroughs' TC 700 which, Vignola stated, was the "most universal discipline" in terms of Society's present and future needs, even though the bank did not have a single TC 700 terminal in its hardware repertoire.

The modular distributed concept followed by the bank as reason for installing different terminals, he said, was the ability to put the best device on the job to fill the bank's needs. "It makes a lot of sense to design the system and then buy the terminals," he said.

To allow communications between the BR 2001 teller terminals and the bank's computer center, a B774 front-end processor was installed. The device makes life easier, Vignola said, especially since it is operating under the standard message format of the TC 700 discipline.

In this manner, the bank's staff can change application programs without changing the terminal program and can change programs in the terminal's 18K minicomputer without changing application programs, he said.

In terms of communications, the bank opted for 10 dedicated phone lines from Southern New England Bell Telephone Co. which carry information through the network at 1,200 bit/sec in a multidrop configuration.

"The implementation of the phone network was less of a problem than anticipated," Vignola admitted. "We thought the new network would need more shaking down than it did" because of the new configuration.

Vignola attributed the lack of major problems with the phone network to having worked with the telephone company before with on-line terminal applications the bank has had since 1961.

To complete the network, the bank installed BR modems at the data center. The teller terminals have built-in modems, he said.

The bank, he added, is spending no more for this network than for the previous 75-terminal network.

The entire on-line system of the 117 terminals (and in-house CRTs and an in-house minicomputer) works off the B3772. Vignola noted the processors are really pretty small – the primary processor has a 400K core memory and the secondary is only a 250K machine.

The processors get the job done, however, as evidenced by the 2- to 3 sec response time for communications to any of Society's 28 branch offices and one service center, he said.

The bank has had a good experience with the BR 2001s, which Vignola said were, the only terminals the bank looked at that could come close to the capabilities specified.

These capabilities included a magnetic card reader for plastic account cards, the provision for an on-line demand deposit system and the capability to read magnetic ink encoded on the bottom of a customer's check.

As Vignola explained, "We don't want to change again. The last change was dramatic," but not without its problems. "The present system "offers a great deal of flexibility for the future."

More Than Savings Data

In addition to savings information, the system makes the customer's name, address and consumer and mortgage loan numbers immediately available to the teller.

The bank was quick to add, however, that while the type and identifying numbers of loans are on-line to the teller, balances are not immediately available at that level unless needed to complete the financial transaction.

A key element of the terminal is its CRT screen. "We wanted that for two reasons," Assistant Vice-President John J. Messer explained.

"First, of course, it enables the teller to quickly absorb transaction information. Secondly, it is a tutorial device. Forms and information are displayed on the CRT for the tellers, enabling them to more easily handle complex transactions," he said.

Another major factor is speed and ease of operation to enable the teller to handle more customers in a given time. "The system actually responds faster when it gets busy," Vignola stated.

"Our system is one of the first in the country to use the distributed intelligence concept, which allows us a great deal of flexibility in dealing with just about any remote terminal," Vignola stated.

Vermont Bank Finds Size of Mainframe Not Disadvantage in Network Upgrade

By John P. Hebert
Of the CW Staff

BURLINGTON, Vt. – The largest savings bank in this state has installed a computerized financial communications system and, in the process, has become one of the first banks in the nation to link it to a small mainframe.

Customer satisfaction and account transaction reliability were the primary reasons Burlington Savings Bank here installed the system in this relatively unpopulated state, according to Bernard W. Barewicz, the bank's vice-president of DP.

Helping to pave the way toward those goals was a low-cost upgrade from the bank's previous IBM 2980 terminal system to an IBM 3600 system, Barewicz said.

The system has given the bank increased capabilities, such as the utilization of magnetic stripe customer account cards and greater data security afforded by IBM's Synchronous Data Link Control (SDLC) protocol, he added.

Before making the upgrade to the 3600 system, bank officials looked at a number of similar terminal systems that could be used with its IBM 370/125 mainframe, including those from Bunker Ramo, Burroughs and NCR.

IBM 3604 terminals, however, were found to be the least expensive units overall; monthly payments for a 2980 bisynchronous teller terminals increased from $150 to between $160 and $170 for a 3604 workstation which can accommodate two tellers, Barewicz said.

The system's 3604 CRTs are used to enter and display account information and read and encode the magnetic stripes on the plastic cards which the bank gives to its checking and savings account customers.

The CRT terminals in the bank's six branch offices transmit customer account information over in-house lines at 2,400 bit/sec to IBM 3601 communications controllers with 65K bytes of programmable memory. These devices, in turn, send the information over dedicated phone lines to Burlington at 1,200 bit/sec.

When the data arrives at headquarters here – some 150 miles from the farthest branch office in Brattleboro – it is handled by an IBM 3704 front-end processor running under IBM's Network Control Program (NCP), where the network software is located.

The information is then relayed to the 370/125 running under IBM's Customer Information Control System. The 125 has 252K bytes of core memory and 3330 disk drives with four spindles.

The mainframe runs the 3600 system effectively enough to have caught the attention of other relatively small banks in similar positions in other states and, in some cases, other countries, Barewicz said.

So far the bank has received little feedback from the customers who hold the cards and, possibly contributing to this fact, the bank used a "low-key, very positive approach to customer information and education about the system," according to a bank spokesman.

The customer only notices there is a new keyboard in front of the teller, he explained, adding they are more concerned with better and faster service.

Commenting on the bank's lack of any need to install something on the order of electronic funds transfer, the spokesman said "Vermont is still Vermont" and "most people here do not understand concepts like computerization and 'the checkless society.' "

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Has Two-Page Refresh Memory

Omron 8030 Incorporates 8080 Micro

SUNNYVALE, Calif. – A CRT terminal incorporating an Intel 8080 microprocessor has been introduced by Omron Corp. of America.

The Omron 8030 display terminal is a firmware-programmed CRT with communications speeds to 9,600 bit/sec. It permits user programming of communications functions from the terminal keyboard, Omron said.

Without adjustments to the terminal, the operator can set up communications speed, parity, bit/word and stop/start bits; the end-of-block terminating character is also user-programmable.

The Omron 8030 features a two-page refresh memory, a total of 2,840 characters, which permits the operator to scroll through both pages of stored display data employing the terminals full range of editing capabilities before transmission of data to the computer, it claimed.

For applications employing the "protected field" mode, the terminal offers literals transmission, a capability which permits identification of the beginning and end of data fields by transmission of control characters embedded in the protected field; trailing space suppress, which eliminates transmission of blank spaces in completed forms; and numeric field definition which prevents the entering of all but numeric characters in certain fields, thereby partially pre-editing data, Omron said.

The terminal has a 15-in. diagonal, 1,920-character display in a 7 by 9 dot matrix format with half-dot shift which yields an effective 14 by 9 dot matrix format, according to the company.

It is RS-232- and teletypewriter-compatible, comes in either automatic or keyboard send/receive models and reportedly has an 8,000-hour mean time between failure rate.

The terminal costs $2,750, Omron said from 432 Toyama Drive, Sunnyvale, Calif. 94086.

Terminal Transactions

Reprogrammable Micro-Based Unit Built by Numeridex for Use in NC

WHEELING, Ill. – Numeridex, Inc. has introduced a reprogrammable microprocessor-based numerical control (NC) terminal.

The Numeridex 9800 offers as standard features a 30 char./sec printer, 300 char./sec reader, 75 char./sec Mylar tape punch and a built-in communications modem, according to the company.

Additional standard features include 5K of memory expandable to 64K and winders and unwinders for both the reader and punch.

The 9800 can be used as a stand-alone manual terminal or as a time-sharing computer assist terminal to generate, edit, duplicate and verify tapes; the reprogrammable microprocessor feature allows later alterations and upgrading without any hardware additions or changes, Numeridex said.

The terminal also offers a fully buffered keyboard, bidirectional code conversions, duplicating with automatic block or line insertions and deletions, error messages and preventers, check-sum verifier and inch to metric conversions, the company said.

The 9800 costs $7,250, which includes all hardware and features, Numeridex said from 241 Holbrook Drive, Wheeling, Ill. 60090.

Trendata Extends Model 400 Series With IBM 2741-Compatible Devices

SUNNYVALE, Calif. – Trendata Corp. has brought out two additional versions of its Model 4000 series of hard-copy communications terminals.

The Model 4000A and Model 4741 offer an IBM 2741 terminal protocol and include operator switchable mode from Ascii to Correspondence, EBCD or APL as well as programmable function keys, the company said.

The 4000A operates at printing and communications speeds of 10-, 15- or 30 char./sec while the 4741 operates at 14.8- and 30 char./sec speeds, according to a Trendata spokesman.

Other features include a basic 512-character buffer expandable to 1,024 characters, additional forms-handling devices and a tape cassette recorder option.

Each terminal carries a basic purchase price of $4,595, which includes the 512-character buffer and a 10-key pad. The terminals can be leased for $155/mo to $180/mo, including maintenance.

Trendata is located at 610 Palomar Ave., Sunnyvale, Calif. 94086.

Omnitec Coupler Kit Designed for TI 733

PHOENIX – An acoustic coupler adapter kit designed for installation in the Texas Instrument (TI) Model 733 terminal has been introduced by Omnitec Corp.

Installation of the Model 1733 is said to be accomplished in about 10 minutes; all parts, including the modem card, necessary assemblies and hardware, are included in the kit, the company said.

Features include an LED carrier detect lamp, telephone cord orientation notice and LSI circuitry, it added.

Pricing starts at $289.82 with quantity discounts available, Omnitec said from 2405 S. 20th St., Phoenix, Ariz. 85034.

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For further details contact Bob Russo, C-S Computer Systems, Inc., 116 John St., New York, N.Y. 10038.

Bits & Pieces

EMM to Offer Memories For Low-Power Applications

CHATSWORTH, Calif. – Electronic Memories and Magnetics Corp.'s (EMM) Severe Environment Products Division will soon offer low-power core memories for use in military and industrial systems.

"We see a definite need for low-power products in severe environment applications that fill the requirements for high-performance, nonvolatile electrically alterable read-only memory (Earom), read-only memory (ROM) and random-access memory (RAM) storage," according to Dave Dickey, director of advanced programs.

"We plan to design the first low-power product around our Sems-9P1 standard product line, which is a 16K by 18-bit planar core memory that has afforded customers an extremely fast cycle time and access time," Dickey said.

The designation for the new product is Sems-9P1LP. It will use three primary design techniques to achieve low power; local power switching, word-complement storage and low-power Schottky circuits.

Features include low typical power consumption of 28 watts and 5 watts in standby. Cycle time is 1,300 nsec with a 600 nsec access time (vs. 900 and 350 respectively for the Sems-9P1), according to the firm.

The capacity is 16K or up to 17 bits. Dimensions, signal functions, and DC voltages are identical to the SEMS-9P1.

Further information is available from the firm at 20630 Plummer St., Chatsworth, Calif. 91311.

'Black Box' Tests Printers

HAYWARD, Calif. – Qume Corp. has introduced a small "black box" which is said to enable users of the firm's Spring Micro 3 character printers to expedite printer performance testing in the field.

Working in conjunction with the printer's MOS/LSI microprocessors, the Micro 3 Activity Monitor conducts an entire diagnostic check on the printers in as little as 35 sec, according to the firm.

Operating without extra power sources, the Activity Monitor surveys the printer microprocessor and read-only memory; checks all I/O lines sequentially and drives the printer carriage through 100 separate printing maneuvers, Qume said.

The monitor plugs into the digital board of any member of the Sprint Micro 3 family. No special interfacing is required; the Activity Monitor works directly with the printer microprocessor, Qume said.

The monitor is priced at $355 in single-unit quantities from the firm at 2323 Industrial Parkway West, Hayward, Calif. 94545.

Field Tester Handles Six Functions

CONCORD, Calif. – Data Test Corp. has introduced the field-supportable Datatester 1200 which is said to provide a single digital test capability to replace separate oscilloscope, frequency meter, pulse timer, digital multimeter, peak reading voltmeter and duty cycle meter capabilities.

The unit measures frequencies to 35 mHz as well as rise/fall times, widths and periods to 10 nsec resolution, according to the firm.

Service functions such as measuring two-pulse coincidence and aligning disk drives are built into the Datatester 1200, and individual plus and minus peak detectors are provided.

The Datatester 1200 costs $1,995 from the firm at 2450 Whitman Road, Concord, Calif. 94518.

T/S Bureau Replaces 370s

Other Users Convince Firm to Get 470

By Toni Wiseman
Of the CW Staff

BETHESDA, Md. – An in-depth survey of all current installations convinced management at Scientific Time Sharing Corp. that an Amdahl Corp. machine was the way to go, even without any benchmarking on the firm's part.

"Our personnel visited every Amdahl installation in the U.S. and spoke with a Canadian site to confirm with other users what improvements they are seeing," according to Daniel Dyer, president of the time-sharing firm.

"Our findings confirmed what Amdahl told us we could expect," Dyer said. "In fact, some of the universities which were running APL reported they were sometimes getting slightly better performances with APL than they were with other work."

Consequently, Scientific Time Sharing installed a 4M-byte Amdahl 470V/6, replacing two IBM 370/155s which had been handling its APL services.

Dyer would not estimate the maximum number of users the system can handle; that figure depends largely on the nature of the work the customers are running, he said, and "the emphasis should be on balancing response time with the number of users to get as many users as possible at a response time that's acceptable."

He did, however, estimate the 470 is about eight times faster than a 155.

As a result, the service firm has adjusted its user pricing by a factor of 7.43 to 1, relative to what it was charging for the 155, he said.

Scientific Time Sharing experienced no problems in installation or conversion, he said. The order was placed on a Monday and the machine was running the following Sunday, Dyer said.

Two Software Changes

Only two software changes were necessary. First, the firm wanted to go to a higher resolution timer because the 470 was so much faster, so software was written to support that change.

Secondly, it moved up from OS Release 21.7 to Release 21.8 to use some corrections made in multiple console support, Dyer indicated.

Scientific Time Sharing is experiencing better than 99% uptime, Dyer said, and has experienced only one hard failure to date. "And Amdahl had it fixed within half an hour," he added.

Two engineering changes have been necessary, he noted, "but in both cases the problems were very minor and Amdahl responded very promptly."

One problem concerns the CPU timer's failure to turn off when the machine is in log-out mode, according to Robert Smith, director of systems.

"This means we end up with some excess CPU time when it's going through machine check processing. But it doesn't happen very often so it isn't a serious problem," Smith said.

Amdahl has delivered a software enhancement to reduce the frequency of the problem and is working on a hardware enhancement which should be ready in a few weeks, he added, noting that Amdahl had indicated this feature would become standard on all 470s.

Tesdata Measurement Systems Feature Data Base Orientation

McLEAN, Va. – Tesdata Systems Corp. has expanded its MS series of computer performance measurement devices with three models offering data base orientation, simultaneous data collection and analysis and turnkey packages.

The systems are the MS-38 Model III, MS-58 Model III and the MS-88 Model III.

Each model has the ability to generate analysis reports without interrupting data collection, Tesdata said. In addition to relieving the host CPU of analyzing data, this mode of operation is said to provide the user with continuous measurement information essential in system performance improvement and trend identification.

Foreground/background program capability is made possible through use of a minicomputer central processor, a 64K-byte memory module and an enhanced version of the Tesdata disk operating system, the company said.

The Model IIIs' data base orientation enables the user to summarize and access pertinent data on multiple systems for an entire month, Tesdata said. The data base – a Performance Data File (PDF) – summarizes data at user-specified intervals.

Automatically updated by the operating system, PDFs can be reported from at any time to facilitate analysis of service performance levels, the vendor claimed.

Standard features on the Model IIIs include a 64K-byte memory and minicomputer; three to four diskettes for a total of up to 2.5M bytes (and, in the case of the MS-88, a single removable 48M-byte IBM 3330-type disk); 72 to 144 sensors; data collection logic with plugboards consisting of four distributors or six or eight collectors; data reduction software; performance management software; and TDOS III operating software.

Also included is the capability to update data files on two, three or four CPUs concurrently; real-time analysis and reporting; and a keyboard or printer.

The MS-88 III costs $5,900 under a two-year lease; it can be purchased for $166,000. The MS-58 III costs $4,250/mo or $119,000, and the MS-38 III costs $2,900/mo or $82,000.

Deliveries of the MS-88 III have already begun and initial shipments of the MS-38 III and MS-58 III will begin in September, Tesdata said from 7900 Westpark Drive, McLean, Va., 22101.

Plotter Helps Builder Plan High-Rise Structures

TOKYO – The construction of modern high-rise structures in or near residential areas can have significant effects on the area's environment – if not carefully planned, they often block out the sun for hours at a time and obstruct radio and television wave signals.

In the booming and crowded cities of Japan, these environmental problems are doubly serious. Poor planning has, in some cases, led to litigation between area residents and the owners of new high-rise structures.

To avoid such problems, the Aoki Construction Co. Ltd. uses a specially developed software package called the Aoki Shadow Investigation System (Asis).

Anticipates Impact

When run on a California Computer Products, Inc. (Calcomp) 763 drum plotter, Asis allows Aoki personnel to generate drawings of the shadow patterns that will be caused by a high-rise at different times of the day.

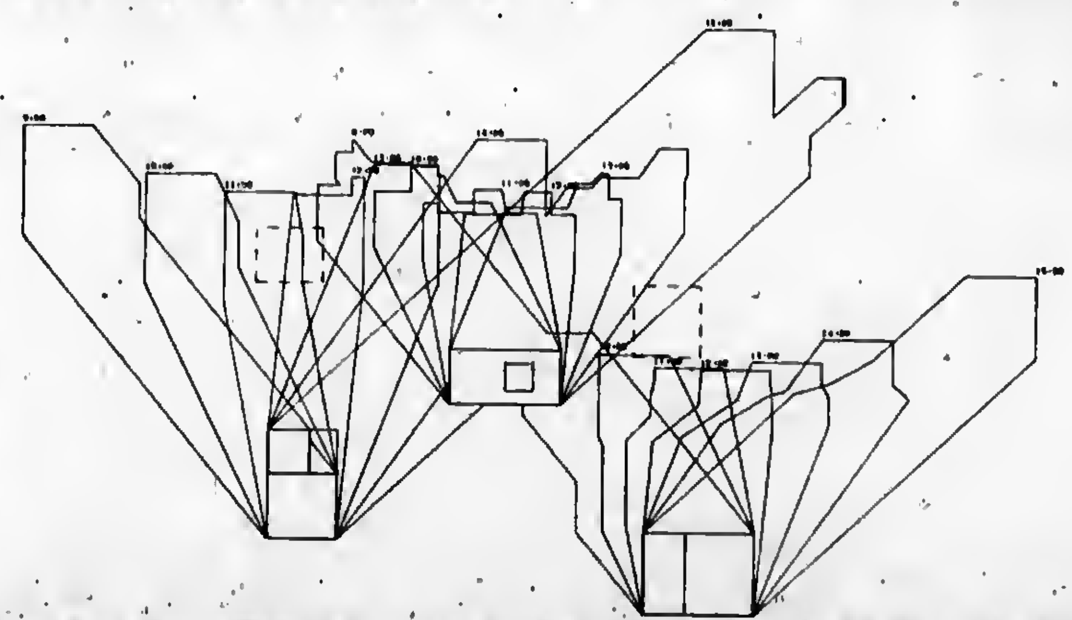
With these drawings, planners can show area residents precisely how their homes will be affected by a structure before it is built.

With Asis, planners at Aoki feed data on the projected structure's position, height and wall surface area and the lay of the surrounding land into the company's Univac 1100 series computer.

This raw data is then plotted on the Calcomp 763 to show the position of shadows caused by the projected high-rise at any hour of any day; the shape of these shadows at any time of the day; and the duration of sunshine on any given day of the year in relation to the area surrouding the projected building.

These drawings are useful not only in checking possible shadow problems during a building's engineering design stages, but also in serving as reference documents which are attached to Aoki's applications for construction approval when they are submitted to government agencies, a spokesman said.

The Asis program allows the user to handle up to 150 structures at a time, and the program can take into account complex topographical conditions such as elevated, low-lying, sloped and terraced terrain, he added.



Tokyo's Aoki Construction Co. uses a plotter and a specially developed software package to generate drawings of the shadow patterns that will be caused by a high-rise building.

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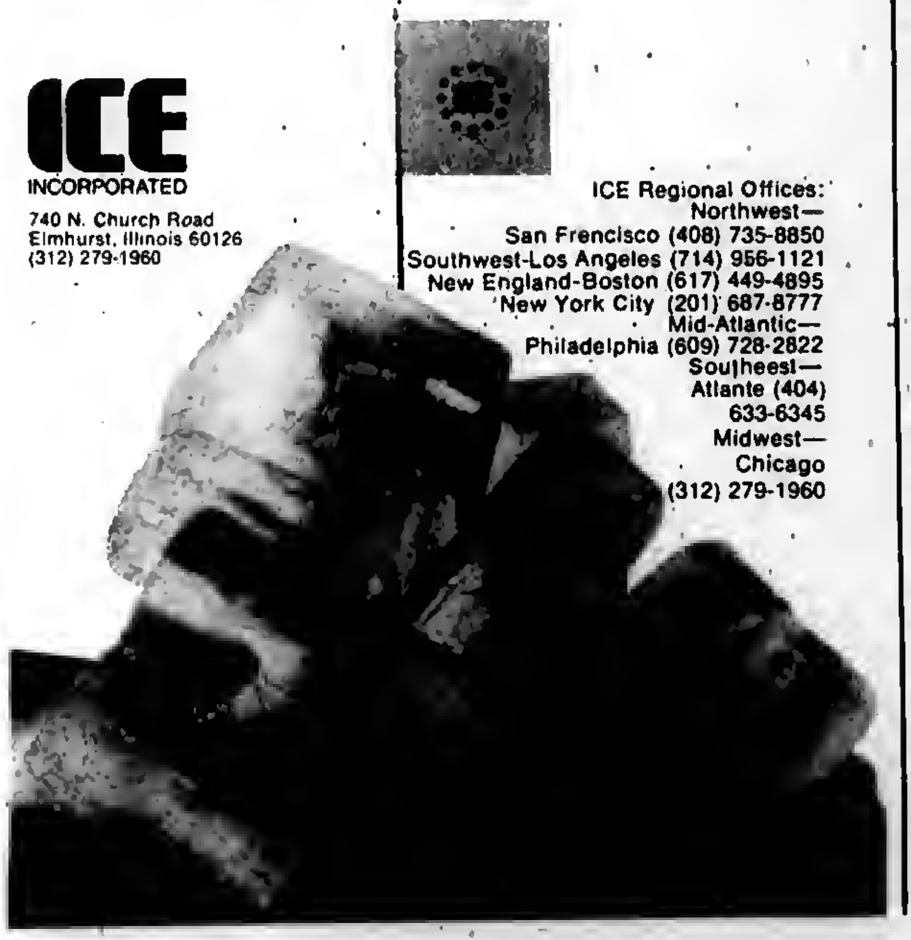

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OCR Brings Savings of $200,000/Year To Canadian Health Plan Administrator

QUEBEC CITY – The Regie de L'Assurance-Maladie du Quebec, Canada's health insurance plan administrator, has implemented an optical character recognition (OCR) data entry function which it said has resulted in DP savings of $200,000 a year and a 35% reduction in manpower.

The plan provides each of Quebec's 6 million residents with coverage for all medical services performed by a physician, oral surgery in a university clinic, all dental services for children under 8 and people on welfare and all drugs for people over 65 or on welfare.

In 1969, when the Regie was founded, only the medical services coverage was in effect; the other coverage was enacted over a five-year period.

The Regie had an eight-month timeframe to develop and implement all systems including data capture, according to J.R. Parent, director of DP. It put out bids for an OCR approach using embossed plastic identification cards for the recipients and imprinters for the physicians.

The OCR route was chosen based on financial and implementation time considerations, Parent said. The optical reader selected was an IBM 1287 Model 3.

Initial volume was anticipated at 90,000 claims per day. Even though the 4-in. by 8-in. claims form was designed to be directly scanned, the Regie felt direct scanning was too risky at that time and opted for a type-and-scan operation instead, Parent said.

The average number of characters per claim after typing was 94 at the beginning, he said, and meeting the daily volume then required 230 typists. Four out of five days a week, the typists work 6-1/2 hours per day.

The fifth day is devoted to "first-level" error correction when the previous four days' production, after having been read and passed through a preliminary validation cycle, comes back to the data capture department in the form of a turnaround document, Parent explained.

Initial volume projections were on the order of 90,000 claims per day but in fact approximately 100,000 were received on the average.

The system worked well for just about 18 months, Parent said, but then problems developed: the insurance coverage increased, the drug plan came into existence, optometric services were included and dental coverage was introduced. These all resulted in additional claims.

The increased coverage was enacted over a three-year period and by mid-1973 daily volume had reached 130,000 claims.

As the coverage increased so did the number of characters per claim, resulting in two data capture shifts and 380 typists.

In addition, the possibility of universal drug coverage loomed in the not-too-distant future.

"This fact alone meant that daily volume would increase by 100% to 260,000 claims. Manpower needs would increase proportionately to approximately 760 typists – clearly unmanageable even under ideal circumstances.

A task force was established with a mandate to put together a request for proposals with 10 specific objectives, the most important of which were minimizing the Regie's dependence on the human aspects of data capture and avoiding changes to the basic claims form as well as the plastic identification card and the physicians' imprinters.

The Regie was disappointed by the seven proposals which were received, all but one recommending changes to the claim form and imprinters.

As a result, the Regie opted for a two-way solution. First, as a result of extensive sampling, the Regie found that approximately 31% of all claims received were typewritten. Because the 4-in. by 8-in. form is not suited to typewriter use, it was felt that if a new form expressly suited to the typewriter were designed, at least 30% of the input volume could be directly scanned by a multifont reader.

After several benchmarks, a font survey and a fairly long contract negotiation period, the Regie opted for a Recognition Equipment, Inc. Input 80 which was to be installed July 1, 1975, he said.

The second solution came after benchmarking IBM, when the Regie found it could directly scan the upper left-hand portion of the 4-in. by 8-in. claim on the 1287 with success.

After further investigation it decided to scan that upper left-hand portion of the claim; install on-line terminals to correct any misread data; enter the remaining data by means of these same terminals; and do a preliminary on-line validation much the same as the first-level error correction.

After a period of approximately four months using a volume of 20,000 claims per week, the results were as follows:

- Of the total data on the claim, 25% was successfully captured.
- Employee productivity went up by approximately 10% because of the switch from typewriters to terminals.
- Claims were ready for payment much more quickly.
- The overall production cycle was effectively reduced by four days.

Translation to Savings

Parent noted that, in terms of savings, the Regie has been able to reduce manpower requirements by 35%; enrich the task of the terminal operator, resulting in a 10% productivity increase and a 1.3% keystroke error decrease; and lower its overall claims inventory by approximately 500,000 because of the quicker production cycle.

"In terms of financial savings, our data capture budget has been decreased by approximately $200,000 per year. This cost savings turned out to be an added bonus for us as we were expecting the new systems to cost slightly more than the old type-and-scan system," Parent said.

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Mini Bits

AIIE to Sponsor Conference

LOS ANGELES – A conference on minicomputer applications in government, business and other organizations will be presented by the American Institute of Industrial Engineers (AIIE) in New York, Sept. 27-29.

The conference is "designed to promote effective minicomputer application by attendees," a spokesman said. Successful minicomputer application experience and "lessons learned" by users will be presented in overviews and case study workshops.

Sessions focusing on minis as an extension of centralized data processing, stand-alone general-purpose systems, networks and minicomputers and turnkey systems are scheduled.

The conference will cost $295; $195 for the third company member at the conference or $265 for AIIE members. Information is available from P.O. Box 25116, Los Angeles, Calif. 90025.

ACT Has PDP-11/45 Buffer

SANTA ANA, Calif. – Able Computer Technology (ACT) has a 2K-byte cache buffer for use with the Digital Equipment Corp. PDP-11/45.

The Cache/45 is contained on a single printed circuit board that plugs into the system's chassis.

Buffer control is provided over every core memory address location on the Unibus. A switch within the memory buffer permits a choice of either on-line or off-line operation, the company said.

The buffer costs $7,000. ACT is at 1538-E Chestnut St., Santa Ana, Calif. 92705.

Interdata Gets Add-In Memory

WESTMINSTER, Calif. – Pushpa International Corp. has a 65K-byte single-card add-in core memory for the Interdata, Inc. 7/32, the firm said.

The card allows 500K bytes of main memory to be added to the Interdata main chassis using eight slots.

The memory features a special "scheme" to bypass the Local Memory Bank Interface, which normally must be extended for each 256K bytes of memory added, the company said.

The memory on eight cards costs $25,600. Pushpa is at 14142 Ipswich St., Westminster, Calif. 92683.

Word-Processing System Unveiled

NEW YORK – Ultra-Text from Base Information Systems, Inc. is a minicomputer word-processing system.

Designed around the Honeywell Level 6 minicomputer, the system uses CRT-oriented text entry and editing to simplify the preparation of documents.

A complete Ultra-Text system with a 16K-word minicomputer, dual diskette, 45 char./sec Diablo servo printer, CRT and keyboard costs about $20,000. The company is located at 437 Madison Ave., New York, N.Y. 10022.

ITC Introduces Micro-Drive Model

NORTHRIDGE, Calif. – Instrumentation Technology Corp. (ITC) has the Micro-Drive Model 101 transport for the 3M Co. DC100A data cartridge, the firm said. The Micro-Drive is designed for use with microcomputers, minicomputers, data terminals and battery-operated portable systems, according to the firm.

The drive features tape motion control. Read/write tape speed is 25 in./sec. Rewind/search speed is 75 in./sec.

The unit costs $470 in quantities of 100 from 1833 Eddy St., Northridge, Calif. 91325.

A Pleasant Side Effect

Mini Affords Firm Management Control

By Esther Surden
Of the CW Staff

HOUSTON – Management control was a pleasant side effect encountered by Brown Oil Tools, Inc. here when it purchased a minicomputer for production control.

The company, which manufactures packers, liner hangers and specialized oil drilling and exploration products, has "already seen the savings over the manual way of doing things," according to Daulton F. Newkirk, corporate development manager.

"Whenever you go from an undisciplined situation to a disciplined situation, you are shown where you need to establish policy where you didn't have policy before," Newkirk said.

Brown is an independently owned company "that grew up from grass roots," he added, and "saw a lot of systems evolve over a period of time."

The minicomputer manufacturing production control system at Brown "gives you a good overview of the total organization so you can go in and institute changes that can give you a considerable amount of savings just by the left hand knowing what the right hand is doing."

The search for a production control system led the firm to Singer, NCR, Honeywell Information Systems, IBM, Burroughs and Univac as well as "non-mainframe producers that had systems in the production control area using other people's hardware," Newkirk recalled.

Burroughs was chosen because it could give the firm "real-time, on-line production control," he said. The nature of the oil tool business is such that "we have to know what is happening now, not what was happening last week," he added.

Prior to the conversion to the Burroughs system, the company had been operating under a completely manual production control system; accounting functions were handled by an outside service bureau.

Currently the firm has its inventory control and accounting applications up and running. The rest are expected to be in operation by December.

"We were told it would take at least two years to get [the production control system] up, but it looks like it will take only another six months. We didn't get our computer until December and we should have it all running within a year," Newkirk said.

Burroughs is installing and supporting the Production Control System (PCS) II software, he added, with Brown's two programmers making program modifications to fit the company's particular situation. All programming is being done on-line via CRTs.

The configuration at Brown includes a Burroughs B1726 system with 192K of memory, seven CRTs 174M bytes of disk and a 450 line/min printer. The cost was about $350,000, according to Newkirk.

The firm has additional CRTs and more disks on order, which will bring the total cost for the system, including software, to about $400,000.

'User Packages' Developed

Over 18,000 parts have been programmed into the system, Newkirk said. The two programmers have also written several "user programs," packages that will be used for special functions such as mathematical calculations in engineering control scheduling or master production scheduling.

"Things of that nature weren't contained in our purchased packages," Newkirk noted.

Order entry, accounts receivable, accounts payable, general ledger and payroll are also all on-line, he said.

The CRTs are located in the warehouse, in the payroll and accounts receivable departments and in a general access area. Three are used for data base building.

Some of the CRTs on order will be put in the purchasing, accounts payable and order entry departments with the balance divided between the engineering department and the shop and warehouse area.

"All of the CRTs are at one primary plant location," Newkirk noted, and are directly connected to the minicomputer.

A feature of the production control system that the company finds very helpful is what Newkirk termed "operation feedback." This allows the company to input each part as it is being manufactured and know which stage of manufacture it is in, he explained.

An added benefit from the system is that "it has cleaned up our engineering bills of materials considerably and I've found that this is one of the weaker points in any manufacturing organization," Newkirk said.

Company Leaves T/S Bureau To Sell Time on Own System

By a CW Staff Writer

ST. LOUIS, Mo. – Turnabout is fair play, according to the management at Warren and Van Pragg, Inc. here.

When time-sharing services became too expensive for the engineering and architectural firm, it purchased a minicomputer. Now the company sells time to others.

"Our outside customers are essentially paying for our hardware costs," according to D.C. Shumate, manager of the Computer Services Division. "And in the bargain we get to use the computer for our accounting and engineering needs."

The company operates six offices with 135 employees in four Midwestern cities. Purchased in January 1975, the minicomputer is a Hewlett-Packard Co. (HP) 3000 with 64K words of memory, 47M bytes of disk, a tape drive and a 200 line/min printer. It is connected to terminals in the accounting department and in the branch offices.

The company relied on local batch or time-sharing since 1971, but rapid expansion in the 1960s made efficient use of computer time difficult, Shumate said. At one point the company was using service bureaus in four different cities.

The company decided to choose a system capable both of filling its internal needs and producing a monetary return because of its commitment to diversify.

The HP 3000 was picked because, "at the time of our decision, it was the only one on the market that could meet our multiprogramming needs," Shumate said.

The firm's time-sharing customers vary from schools to a market research company to a research design firm, according to Wayne Chisenhall, a systems analyst who, with Shumate, does all the firm's programming and occasionally helps out its customers.

The primary in-house application is accounting, Chisenhall noted. However, all the engineers have access to the system.

A project management program which essentially gives job cost accounting information to the engineers allows them to identify trouble spots in the projects, Chisenhall said. The system reports the profit of the jobs and percent of completion and gives status reports on how the jobs are progressing.

The availability of the in-house system has enabled the company's engineers to reduce processing costs by 60% over the former cost with time-sharing, Shumate said.

A portion of the savings can be passed on to clients, a plus during negotiations, he added.

For example, instructions for a water distribution program, used to analyze water flow and pressure, had previously been sent to a batch service bureau to be keypunched and processed. Upon analyzing the results, the engineer would change the variables and rerun the program.

In some offices like the one in Decatur, Ill., the intermediate solution took up to five days. Now the interim results are available within an hour and many of the problems are solved the same day.

Remote engineers have increased flexibility with the system, Shumate said. An engineer, after making telephone contact with the central system, can build an input file on the terminal and instruct the system to run the program.

The output can be directed to a disk file where key points can be spot-checked with the Editor or printed in its entirety on the office terminal. Parameters can then be changed and the program rerun.

In case output is lengthy, the output can be directed to the line printer and the results mailed, Shumate said.

Guide Explains Mini Popularity

PENNSAUKEN, N.J. – "Sophisticated users were quick to find the minicomputer an attractive alternative to waiting in line for a batch processing system," according to Auerbach Publishers, Inc. in a preface to the firm's *Guide to Minicomputers*.

"Minicomputers are not only cheaper and faster than their general-purpose cousins, but also technologically more advanced," Auerbach said.

"Although 'dispersal of computer power' is currently a popular phrase, minicomputers have been dispersing computer power for more than eight years," the guide said.

An introduction to minicomputers described the history, growth and present technology of the systems. There was also a general article on microcomputers and semiconductor technology.

The 360-page soft-cover book has in-depth reports on over 40 minicomputers, including the Honeywell Information Systems Level 6, the Digital Equipment Corp. PDP-11 and PDP-8 families and Data General Corp. Eclipse and Nova systems.

The guide incorporates user interviews which detail the importance of features to potential users, available options, interface requirements, storage types and their capacities, data structure and I/O device speeds, the firm noted.

It also has comparison charts on minicomputers and microcomputers and addresses of suppliers.

The guide costs $34,95. Auerbach is at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Determines Departure Times, Routes

'Super' Minis Keep Brazilian City's Trains Running

SAO PAULO, Brazil – Three "super" minicomputers at the central control of this city's mass transit system are keeping trains running.

The North-South line of the Metro stretches 17 kilometers and links the northern Santana and southern Jabaquara suburbs with the center of Sao Paulo. Ninteen stations are thus far open along the line. An East-West line is under construction.

The trains are controlled by three Westinghouse Electric Corp. systems in a central control facility.

One of the P-250 systems is an on-line unit, supervising, scheduling and monitoring the operation of the network. The second system is used as a standby unit to provide backup for the on-line system. The third system is used primarily for simulation of the system, for experimentation and for operator training.

The system, guided by operating schedules, checks for correct train makeup and determines the departure times from the stations. It also makes sure the trains are routed properly.

The mini can use corrective strategies for safety purposes. Train speeds can be adjusted and intervals between trains can be lengthened. Station dwell times can be changed and train dispatch schedules revised.

The system keeps track of train speeds and schedules and displays these on request.

For maintenance purposes, it keeps records of accumulated car miles and operating hours by coupling train identification numbers with automatic car identification data from cars departing the yards.

The system can also monitor power consumption based on data brought in from remote sensors, according to Metro spokesmen.

Monitors Operation

In addition, the system monitors the operation of equipment such as escalators, passenger gates, fans, vents, power circuit breakers and pumps. If a unit malfunctions, the mini alarms the operator and logs both the nature of the malfunction and the operator's response to the alarm.

It also operates the central display boards that show the entire system's status.

One display board shows train operation. It is associated with a train control console. A specific location lights up when an alarm condition comes in from the field within that zone. A white illuminated track section indicates nonoccupancy, while red indicates occupancy.

The track zones shown on the board represent functional zones: station zones, interlocking zones, interlocking approach zones and turnback zones.

The train control console enables the central line operator to take over the control of any part of the system should he feel the conditions require some special intervention. He can communicate with the attendant on board the train and with any passenger platforms through the train telephone system.

Through pushbuttons on the performance control head, he can override the automatic train controls and can specify the station dwells, run-throughs or train speeds from any station he designates, but only to the extent that any of these actions are still safe.

If the operator should inadvertently request an action that would not be safe, the automatic equipment would prevent it from being carried out, the spokesman said.

A routing control head enables him to address any of the interlockings on the system to "request" a special route for the next train to approach that area.

Third Method

A third method of interfacing with the computer is through the CRT keyboard on the console. The supervisor may request the computer to display the past performance of the train so he can tell at a glance whether this train is running to schedule.

He can also request the identification numbers of one or more trains in any stipulated section of track or ask where a particular train can be found. The CRT is also used to display messages from the mini to the operator, some of which require the operator's response.

A second console is used to control system support facilities, which are located mostly underground and include things such as ventilation fans and water pumps.

This console shows the operational status of these facilities and also displays alarm conditions like station trouble, fire or communications failure. Emergency telephones located frequently through the underground sections, in the stations agents' booths and at yards terminate at this second console.

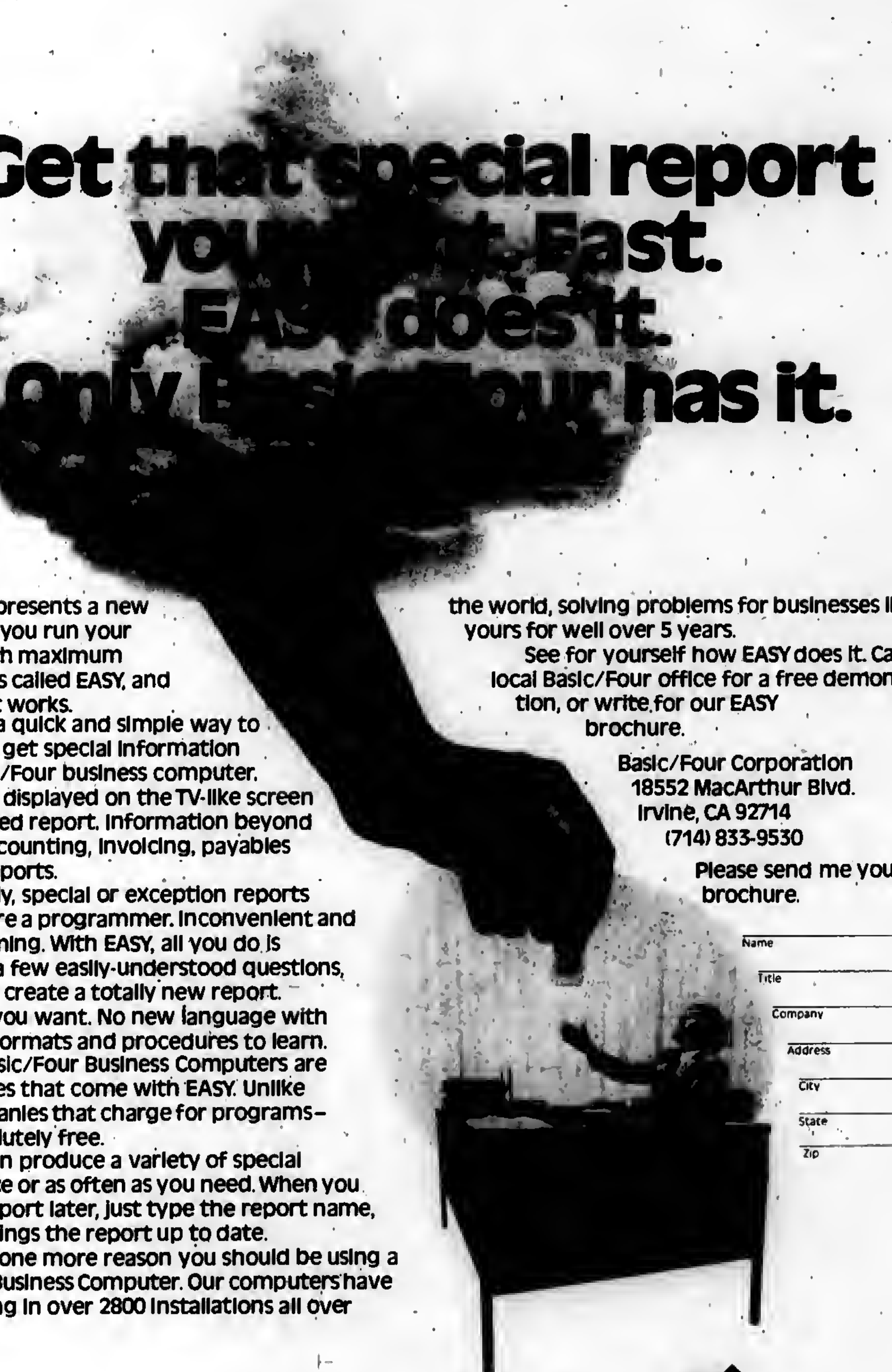
A third console, display board and associated CRTs serve the system's electrification facilities. They correspond to the conventional power controller or power dispatcher position in an electric utility or electric railroad facility. They monitor and display the status of the high-voltage and low-voltage circuit breakers and the power contact rails.

The fourth console "controls" the passenger flow in and out of the stations. The attendant observes the passengers at each station via a closed circuit television system and varies the speed of the escalators and operation of the access gates to provide a smooth flow of riders.

The Metro central computer control has the ability to supervise operation of the network to see that daily train schedules are maintained as closely as possible.

The control that performs these optimizing functions describes the real-life system. It includes a model, which is essentially a tabular representation of the Metro system corresponding to the discrete locations where information for control is obtained and where control adjustments can be made.

The simulation program can be used to test proposed changes in the system.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Independent Printer Saves Parts Dealer $325/Mo

By a CW Staff Writer

HARBOR CITY, Calif. – Secure in its mixed-vendor environment, an automotive parts dealer here estimated it is saving $325/mo and increasing its printing capacity 27% by going with a non-IBM printer, according to Donald Lamb, operations supervisor.

The company, Appliance Industries, an IBM 3 user, began to expand its business several years ago when, as a result of the gasoline shortage, Americans were fixing up older cars instead of buying new ones.

At first the firm had a 3/10, but outgrew it about a year ago when it decided to put on new applications involving CRTs and teleprocessing, Lamb said.

"We had outgrown the system and wanted to move to a two-partition environment," he noted.

The previous system included 32K of core, including 8K from IBM and 24K from Business Systems Technology, Inc. (BST) a Santa Ana, Calif. company, two BST/45 disk drives, an IBM 5444, and a BST 750 line/min printer.

The firm upgraded to an IBM 3/15 with 96K of core, one CRT, a 3742 diskette, 3741 direct entry device, card reader and two additional BST/45 disk drives. The firm carried over the BST 750 printer and two other drives from the old system.

"We are carrying over the BST equipment for a good reason," according to Vic McDonnell, Appliance's director of data processing.

"I wouldn't have gone to an additional two drives for the new sytem if we had had problems with the current ones. I've had the 750 line/min printer since October. It's smaller and quieter than the IBM 1403 we used to have here."

The printer is maintained by Sorbus, Inc., Lamb said, and there has been very little trouble with it. The conversion from the 3/10 to the 3/15 went smoothly as well, he noted, saying the vendors involved worked to make certain it went smoothly.

"I'm not going to go out on a limb against IBM and say everyone should switch to a BST printer," McDonnell said, "but for my shop here, I've had good luck with BST."

The firm is currently running accounts payable, receivables, payroll; bill of materials, order entry and invoicing as well as general ledger applications on the system.

IBM 3 Models Get BST Printer

SANTA ANA, Calif. – Business Systems Technology, Inc. (BST) has a plug-compatible 550 line/min printer for IBM 3 computers.

The BST/550 can be used with 3/8s, 3/10s, 3/12s and 3/15s and is field-upgradable to a 750 line/min rating, the firm said. The charge would be the additional rental for the BST 750 line/min printer, a spokesman said.

The printer uses a chain-train printing mechanism and is fully buffered to enable the CPU to continue processing between line settings, BST said.

The unit features paper-low, paper-out and paper-runaway sensing devices and paper-jam and clutch-out indicators. The clutch-out indicator halts the computer when the clutch is not properly engaged, BST said.

The printer can make as many as six print copies and can accept multipart forms from 3-1/2 in. to 19-1/2 in. wide, the company noted.

The printer costs $683/mo or $650/mo on a one-year lease. Two-, three-, four- and five-year lease plans are available from BST. The firm is located at 3015 Daimler St., Santa Ana, Calif. 92714.

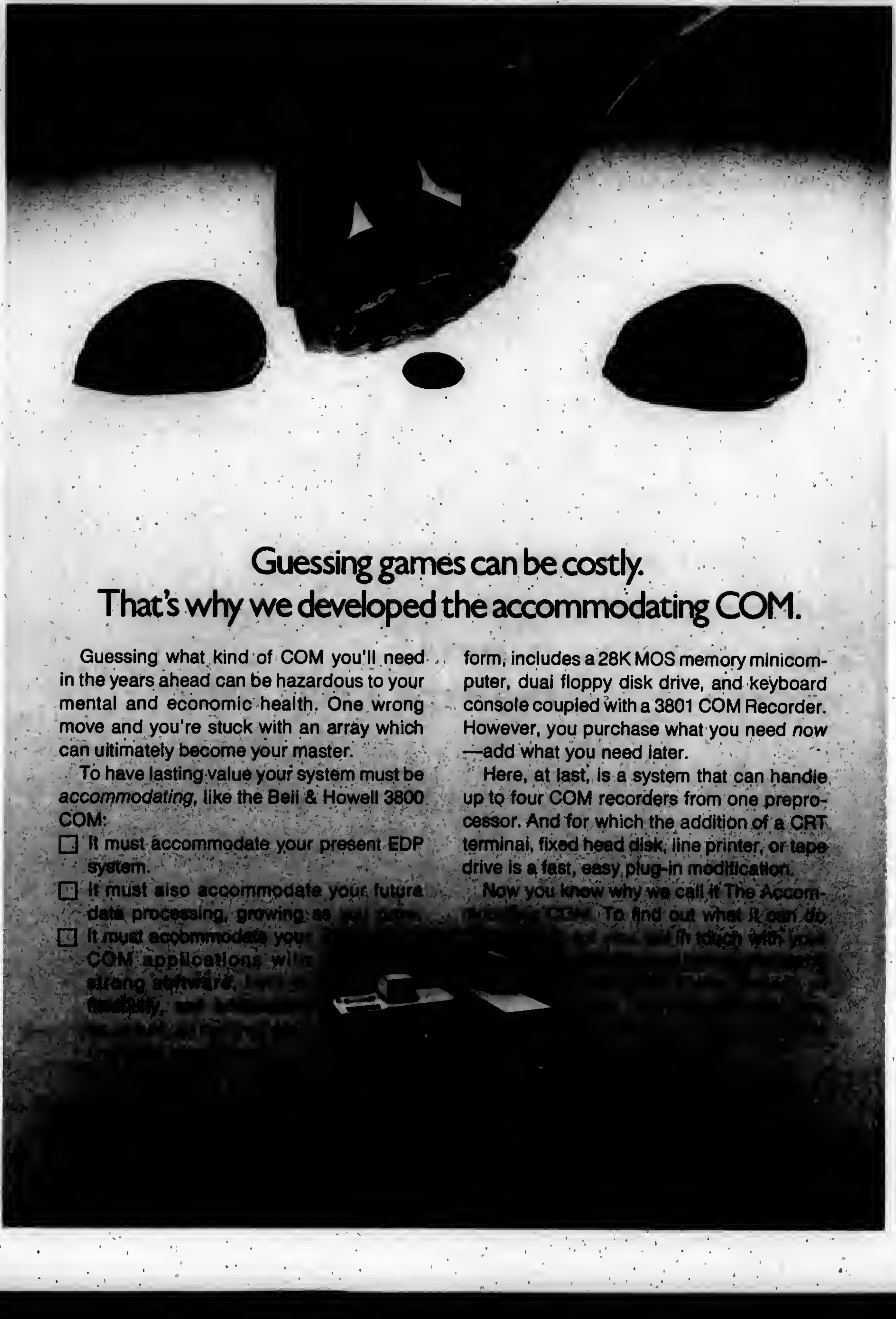
NCR Announces Medics Version

DAYTON, Ohio – NCR Corp.'s Medics Admissions, Discharge and Transfer (ADT) is a version of the firm's Medics A-10 and A-20 system, according to a spokesman.

The system requires a 128K Century minicomputer or a larger computer. Up to six CRTs and 24 NCR 260 thermal printing terminals can be accommodated by the unit, NCR said.

Data is entered during the admission process via the CRTs using custom-designed screen formats. A hard copy of the admissions form is provided by the matrix printer. Information is filed on magnetic disk and sent to various terminal printers throughout the hospital, notifying different departments of the services that may be required.

Medics ADT with a 128K Century 101, NCR 656 dual-disk unit, card reader, line printer, matrix printer, communications equipment, two CRTs and seven thermal printing terminals costs $4,900/mo or $176,865 for the hardware alone. Software is licensed for $240/mo under a five-year agreement. An option of a one-time licensing fee of $11,000 is also available. Installation costs $13,500, NCR said from Dayton, Ohio 45479.



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HP Enhances Lab System

WALTHAM, Mass. – A catheterization data analysis system with more software capability than the previous models and an enhanced minicomputer is available from Hewlett-Packard Co. (HP).

The HP 5600S system is designed for hospitals with a single catheterization laboratory. As the case load increases and exceeds the capacity of a single lab, the system may be expanded to handle a second laboratory.

Using analysis techniques similar to the earlier HP 5690B lab system, the 5600S offers additional standard software capability, it said.

The single-bay 5600S computer system consists of a 21MX processor with 32K of memory, 5M bytes of disk, a paper-tape reader, catheterization keyboard and system console.

The basic HP 5600S costs $64,000. HP Medical Products Group is at 175 Wyman St., Waltham, Mass. 02154.

Many 'Running Out of Steam'

Users Warned of Mini Limits

COSTA MESA, Calif. – Many of today's minicomputers are "running out of steam," placing undue, and sometimes unexpected, limitations on the users, according to Robert Lowry, board chairman of Technology Marketing, Inc. here.

"A fact of life often misunderstood by corporate executives in such user industries as electronics is that even some of the newest minicomputers are limited in a number of ways, including address and throughput," he said.

Not Sufficient for Future

"As a result, the machine that barely meets a user's present needs will probably not be sufficient in the near future. That is especially true if a computer is designed into a piece of equipment the user produces: when he needs to upgrade the system, he will probably find his present minicomputer isn't powerful enough to handle the new tasks," he added.

"When that happens, the user may have to scrap the existing processor and start designing again around a new, more powerful computer. Even worse, it may be necessary to invest considerable funds in modifying or completely redoing the expensive software base of the older product.

"That's a serious waste of manpower and economic resources – and it is completely preventable if line management properly controls the initial technical decisions.

In addition, the design must incorporate a convenient means for expansion of the memory to accommodate future growth needs, he said.

In most cases these problems can be solved if line management pays attention to a computer characteristic known as "data path width," Lowry said.

"In general, minicomputers today have data path widths between 8 and 32 bits. From the design work we've done, we have concluded the 32-bit machine will solve most of these limitation problems. It will also provide the user with sufficient latitude for future upgrading of the system," he continued.

"It's only the CPU which costs costs more than the 16-bit computer, Lowry said, "but that fact, taken out of context, is liable to mislead the unwary executive.

"It's only the CPU which costs more. The peripherals and the software cost nearly the same. The net result is that the 32-bit computer gives a user many times the capability for less than twice the CPU cost – perhaps only 50% more. This is important because the CPU is usually less than 15% of the total system cost."

Proper Selection

How can the nontechnical line executive assure that the proper computer is designed or selected for his requirements? "There are only two ways we know of," Lowry said.

"One is to add computer design specialists to the engineering staff – but in general, that's only economically feasible if the firm is faced with several computer design decisions annually."

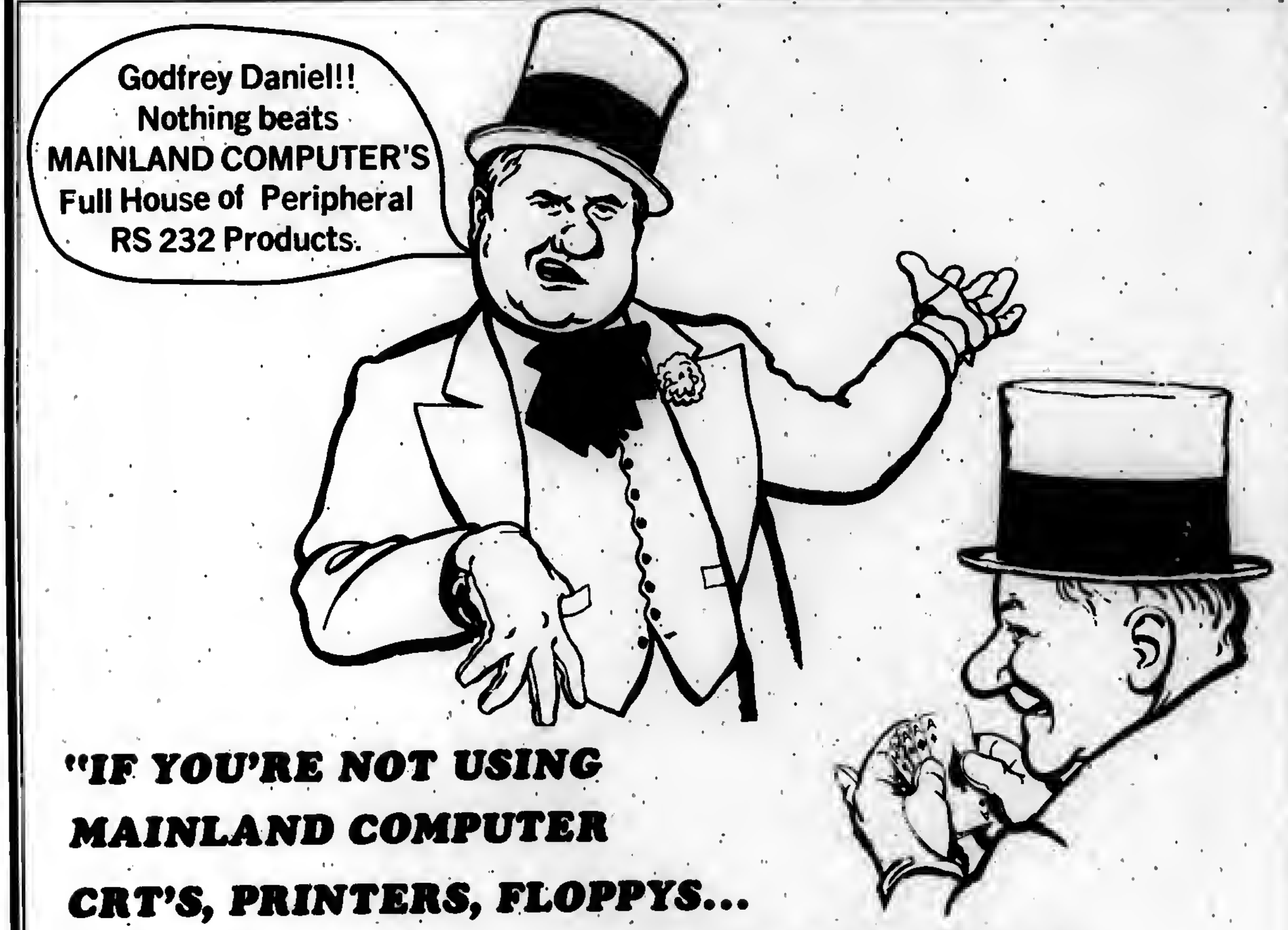
The second approach, which is preferable for most firms, he said, is for management to define what the computer must do, and then use competent outside services to aid in the development.

Plotter Uses 5100 Output

AUSTIN, Texas – The Houston Instrument (HI) PTC-5 plotter controller has been modified to accept output from the IBM 5100 portable computer, according to a company spokesman.

The unit can now generate plots using the Complot DP-1, DP-3 or DP-7 digital plotters, the firm said.

The PTC-5 costs $1,945 from HI at One Houston Sq., Austin, Texas 78753.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Data Communications Terminals

A Computerworld Special Report

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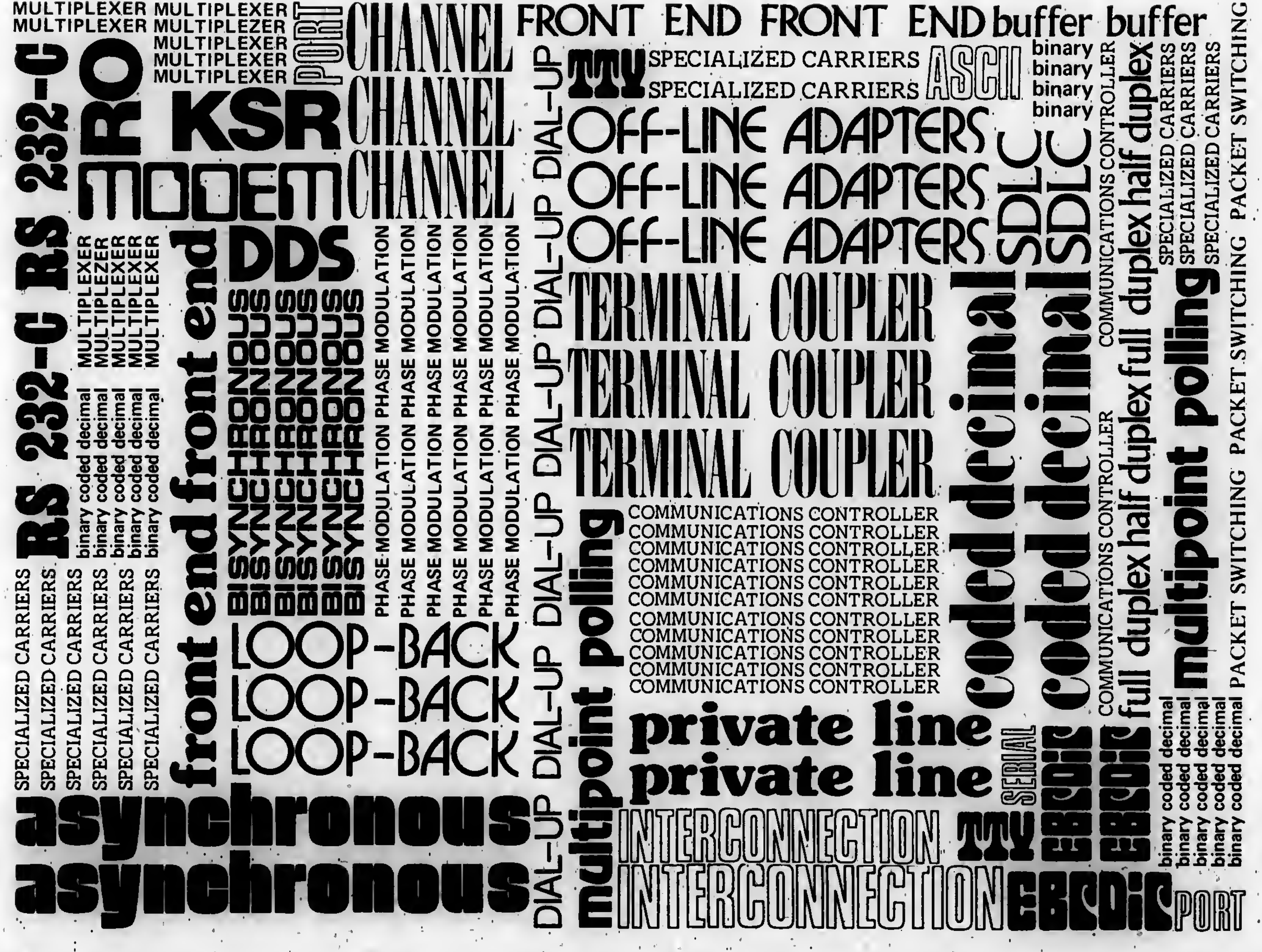

Bank System Software Modified

Automatic Terminal Polling Cuts CPU Utilization 25%

By Mal Stiefel
Special to Computerworld

HONOLULU, Hawaii – SLH, Inc. has seen utilization of its IBM 370/145 drop from 65% to 40% after independent software changes to its IBM 3705 front-end control program. The changes permitted the 3705 to poll 250 asynchronous TRW, Inc. terminals automatically without involving the CPU. Previously, the polling was handled by IBM's CICS in the 370/145.

Additional changes were made in 3705 software to permit the system to interface with 20 Addressograph/Multigraph (A/M) Amcat 1 credit verification terminals.

SLH, formed by Honolulu Federal Savings and Loan Association (Honofed) and nine other Hawaiian savings and loan institutions in November to handle their electronic funds transfer (EFT) task, chose the software modification route instead of buying a $90,000 minicomputer offerred by A/M to tie the Amcats to the 3705.

Comm-Pro Associates of Manhattan Beach, Calif., handled the 3705 program alternations for SLH.

The system includes, in addition to the 370/145, two Burroughs Corp. 4700 computers tied to the 145 over 1,200 bit/sec lines with Universal Data Systems modems. The 4700s emulate IBM 2260 remote terminals using other Comm-Pro software.

Also, the Model 145 uses the Synchronous Data Link Control (SDLC) protocol and a 3704 front end linked to five IBM 3614 automated teller units installed in shopping centers and eight other 3614s in Honofed branches.

EFT switching between the Model 145 and the Burroughs computers is managed by the Cop program developed in-house by SLH. Cop, which incorporates the data encryption algorithm proposed by the National Bureau of Standards, is being offered as a stand-alone package to other banks that want to run an EFT switching operation in a CICS environment.

To facilitate processing, all messages from computer to computer and between computer and terminal are transmitted in a standard format throughout the system.

EFT Prompts Merger

Before SLH was created, Honofed processed data on the Model 145 for itself and four other banks; two banks used one of the 4700s, and three banks used the other 4700.

In the pre-SLH configuration, Honofed had acquired the 250 terminals, scattered among the five banks on its system.

An IBM 3705 had been brought in to perform the front-end communication services for this network, running in conjunction with a teleprocessing software package purchased a number of years ago and modified extensively by Honofed to suit its needs.

When the 10 banks decided to establish SLH and turn to EFT, they agreed the 3705 would service all of the members; this led to the requirement to link the 145 with the 4700s.

At the same time, they wanted to add the 3704 and the 3614 teller terminals running in a manner which would permit each bank to retain its own customer credit card numbering system. All the cards were to incorporate the American Bankers' Association's (ABA) standard Track 2 magnetic stripe.

In addition, they were searching for an on-line point-of-sale (POS) terminal that could support deposits, withdrawals and the cashing of checks during normal business hours in retail store locations.

Search for a Terminal

At that time, the Amcat I seemed to be the only terminal available that could fulfill all of SLH's functional requirements for the POS terminal: printing capability for positive credit authorization driven by the host computer; support for a personal identification number supplied by the customer to the sales clerk; and compatibility with ABA standards for the magnetic stripe credit card.

Still it was recognized the Amcat wouldn't be compatible with the 3705. After A/M made its bid to supply the $90,000 mini, SLH looked for alternative solutions, finally asking Comm-Pro to make the Amcats and the 4700 computers look like 2260s to the front end.

Comm-Pro did the design and coding in its home office. A one-day 10-hour installation and testing session took place in Honolulu when everything was ready. The 3705 software changes have been working satisfactorily ever since.

A Comm-Pro spokesman explained the program changes were made using a 3705 cross-assembler which runs on the 145. Then the altered program was stored as a load module in the core image library, like any other cataloged program.

When it was time to test the fix on the 3705, the front end was switched into program load mode, and an IBM-supplied utility was executed on the 145 to replace the IBM control program with the modified version.

A "vanilla-flavored" version was also kept on the system, so IBM could restore the system to its original condition to run its own diagnostic tests.

IBM agreed informally that its maintenance agreement with SLH wouldn't be affected under these conditions, Comm-Pro said.

In a separate task, Comm-Pro designed

(Continued on Page S/6)

Basics Often Ignored in Selecting Gear

By Richard A. Kuehn
Special to Computerworld

Today's environment makes the selection of any terminal system a lesson in frustration. It is extremely easy to become deeply involved in the technical aspect of the equipment under consideration, the "latest state-of-the-art" construction and all the other buzzwords designed to show expertise at the task of data communications.

Doing this all too often can result in forgetting or ignoring the basic thoughts that must go into every system design and selection.

In many cases this beginning design evaluation is in fact mentally conducted. However, also in many cases it is forgotten in the drive to secure the latest terminal or system available. In other cases it would be wise to remember that management, the same management that has to approve the project, usually understands the simple explanation and has the greatest interest in what will be the result of the program on bottom-line operating results.

With that in mind, it would not be out of place to review those points which must first be considered when selecting a terminal vendor.

Keeping Abreast

The first thing every DP manager does is to try to remain abreast of every new terminal introduced on the market. When it is necessary to select new terminals, either as a replacement on an existing system or for a new application, it is natural to want the latest, up-to-date gadget available.

However, if that terminal is manufactured by an itinerant group of camel herders in Mauritania with same-day service dispatched from Timbuktu, it would not seem to be a wise selection.

Yet all too often the fanciest, latest terminal available is selected while system support arrives by plane from some remote location. This is fine if pride of ownership, not operation, is the key to success for the installation.

The first item to review is the location of each terminal and its proximity to service as well as experience of other customers with that same supplier.

While reviewing these locations, it is generally a good idea to review the existing terminals already in place and working. This has several advantages.

First, if the new application can be brought up on the existing equipment, it is obviously a much lower cost method of reaching the goal. Or, conversely, if the existing applications can be incorporated onto the new terminals, this will result in an overall reduction in gross system operating costs and a more cost-effective system.

Operator Errors

Also, during the course of the review, it is best to determine the caliber of terminal operator available.

It is a well-established fact that while everyone strives to reduce transmitted errors through sophisticated codes, better communication facilities and the like, the majority of errors are really entered into the system by the terminal operators.

Thus, asking a large population of users or a relatively unsophisticated user to operate a terminal with a control panel similar to that of a 747 jet is asking for trouble. Early into the system design, when it is determined a new terminal will be required, the actual terminal user should be involved.

All too often this man/machine interface is either ignored or left in the hands of a system analyst who is unfamiliar with the operator's requirements and environment or in some cases has not even seen the operating location of the terminal.

The involvement of the actual user will prevent many of the potential errors due to a poor interface between the human and the terminal. It will also increase the acceptance of the terminal provided because the user will feel involved in the selection and therefore somewhat committed to the success of the system.

With these two points in mind, the next two major factors to be determined are the volume of information to be transmitted by each terminal site and the time value of that information. First the number of records on quantity of information must be determined. This will have some effect on the quantity of terminals, transmission speed and similar areas.

Time Value of Data

With increased volumes comes increased speed, and as speed increases so does cost. At the same time it is necessary to determine the time value of the information. Is this a real-time system or is it sufficient to receive the data three days later?

Too often the question is asked: "How can we solve this problem with the computer or with terminals or with data communications?" Really the first question that should be asked is "How can we solve this problem?" with terminals and communications becoming only one solution.

Obviously, if the information is not required for three days, it may be sufficient to use some large data gathering terminal and ship the card or tape output to the remote site by some common carrier such as truck or air freight. However, if a real-time inventory control system is the goal, then terminals using some wire or circuit connection from the telephone company or specialized carriers are required.

Again the time value of the information must be considered, and the decision between leased channels providing actual real-time connections and the slower, but perhaps less costly, dial-up or Wats facilities must be assessed.

Obviously during this process the designer cannot be working in a vacuum. The potential of increased volumes in this application or the addition of other applications must be considered.

With this background it is now possible to begin to interview those potential sup-

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Lines Between Types of Terminals Seen Disappearing

By Stephen J. Callahan
Special to Computerworld

At one time in the not too distant past, terminal categories were fixed in their functions and comprehensible to the user. With the advent of inexpensive microprocessors and microcomputers, the boundaries between types of terminals and their respective functional capabilities are virtually lost.

Even the most unassuming of today's terminals are likely to support a rather complex array of switches and control lights that will allow changes in speed, transmission code and parity.

More sophisticated terminals offer an enormous range of options. The terminal can change from batch to interactive mode, operate a local or remote cluster of terminals, interrogate local or remote data files, perform processing jobs locally or off-load to a host computer, operate in native mode or emulate any of a number of different devices.

With this range of capabilities, the bedazzled terminal buyer is easily confused and wont to ask "what is it?" The reply – "anything the user wants it to be."

There are also newer classes of terminal devices that are emerging as a force, especially in the construction of networks. These devices are called by an assorted number of names – terminal processing systems, workstation terminal systems, distributed processing terminal systems and network processors – but their sophistication makes defining them a task.

These terminal systems operate with or are supported by a minicomputer or small business system. They represent combinations of several classes of terminals, but beyond that they have little in common with the traditional terminal devices. They are important in today's market because they offer "ready to use" packaged configurations for establishing distributed communications networks.

Terminals are designed with a primary mission in mind. While many terminals can point to a laundry list of functional capabilities, the deisgn of the unit or the experience of the manufacturer fosters a strong orientation toward a limited application area.

Many of the so-called extended functions of a terminal are actually add-ons or afterthoughts to the basic orientation of the unit. This means the basic function of the machine will be completely thought out and fully supported, and the add-on functions will not be as completely developed or supported.

Terminal Categories

By identifying a given terminal's primary mission, a user can still point to a functional description of terminal devices and make some sense of the available units. As part of the identification process, the definition of terminal categories needs to be updated since many of the traditional categories have been and are changing.

Some of the more familiar terminal categories are the following:

- A/N display. The A/N display or CRT has come a long way. The originals were complicated to program and dependent entirely on a host computer. Today the overwhelming majority are intelligent, easier to program and virtually independent of the host computer. They come in stand-alone and cluster varieties.
- Teleprinter. The homely teleprinter began life as an electromechanical chatterbox. These were unpleasant to be near because of the high noise factor; they were also slow and offered limited characters sets. The current varieties are sleek in design, offer a wide range of speeds and, because of the modern techniques of character creation, some even offer a limited graphic capability. Many of the current teleprinters are either silent in operation or well padded for a much reduced noise level.
- Intelligent terminal. Since almost every new terminal is described by the manufacturer as intelligent, it would seem all terminals fall into this class. However, one may differentiate between the truly intelligent device, which is microprocessor-based and programmable by the user and the "educatable" device which is microprocessor-based, but programmable only at the factory.

For many of the devices, the general-purpose intelligent terminal classification is a transitory one. As the user's understanding of these devices increases, he generally migrates to a more specific category such as data entry.

- Remote batch terminal. The original remote batch terminals were in reality little more than card readers for submitting jobs to a host computer and printers to record the results of processing. Today most remote batch terminals are intelligent systems supporting a wide range of peripherals including disk storage, data entry terminals and in some cases interactive terminals. Some of the newer remote batch terminals can support concurrent remote batch and interactive functions.
- Word-processing terminal. In its simplest form this device is a typewriter with memory. However, like many other terminals, the current word-processing system has evolved into a text-editing device that can operate locally or in a communications mode with a host computer.
- Data entry terminal. This class of terminal originally appeared as a replacement for the keypunch machine. Data entered through the keyboard was captured off-line on magnetic tape. The storage media now includes cassettes, cartridges, floppy disks and hard disks. Online operation is also a common feature.

A new class of terminal that defies definition, the so-called distributed terminal system, is appearing. This class of terminal device purports to do everyting – process jobs, manage a data base and control a communication network. In short, it is the ultimate terminal device.

Why Not the Ultimate?

Why fool around with anything but the ultimate terminal? The answer, of course, is that the base line in selecting a terminal is a matching of user needs with a terminal that is adequate to the job.

If needs are changing rapidly, the user may elect a chameleon-like terminal system. However, most terminals are bought to satisfy a rather fixed, well-defined set of needs. It is this user that has the difficult challenge of selecting a given terminal from the myriad of offerings.

Until recently users were frustrated with

(Continued on Page S/14)

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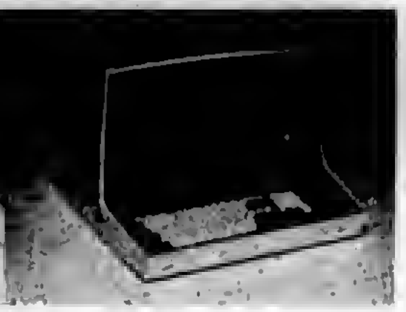
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Without Leaving Window

Terminals Keep Tellers Up-to-Date

HYANNIS, Mass. – Cape Cod Bank & Trust Co. (CCB&T) here has a low-cost, easy-to-use teller inquiry terminal that fulfills its requirement for up-to-the minthe information, the user said.

The system was developed jointly by the systems and operations department at the bank and Datatrol, Inc. of Hudson, Mass. specialists in bank teller information and communication systems, according to the bank's president, James H. Rice.

The system has been operational since November of 1974 and CCB&T currently has 13 branches on-line with 72 teller terminals installed. Recently, Martha's Vineyeard National Bank, a correspondent bank of CCB&T (which it considers to be its "overseas operation"), has been added to the network.

The Datatrol TPS-370 system enables tellers to obtain balances on checking, savings and loan accounts and to place holds on checking and savings accounts.

Additional Information

Should the customer want additional information on his account after making a savings or checking withdrawal, the teller depresses a key marked "INFO" and the appropriate code to obtain the necessary information. Within seconds the teller is able to tell his customer the available balance, the data and amount of last interest, next date of interest and average collected balance for the year to date, just to name a few items.

The device that allows tellers to accomplish these functions is the Datatrol TT-22 teller inquiry terminal. Looking somewhat like a small hand-held calculator, the TT-22 has three main areas: a 16-digit keyboard, a message display panel and a numeric display panel.

Situated at the teller's window, the terminal appears to the customer like an adding machine, when in effect it is the teller's main source of obtaining information on all the accounts a customer may have.

It is no longer necessary for a teller to leave the teller window to check trial balance information. This transparency is said to leave both teller and customer in a more relaxed and confidential atmosphere while conducting bank transactions.

"The terminal we chose is very easy to use and is practically foolproof," Robert Neese, vice-president of operations, said.

CCB&T teller operates inquiry terminal.

"Our tellers have found the terminal has become their right arm – something they can't and don't want to do without," he added.

Branch Controllers

The Datatrol system includes 13 branch controllers, each handling up to 30 teller terminals. The controllers transmit their data over private phone lines to a Datatrol concentrator that acts as a front end to the NCR Century 201 CPU.

The bank owns the equipment and paid $365 for each terminal, Neese said. Previously the bank used a manual system which required a teller to check a local customer file or place a phone call to the DP center.

Local files were maintained in hardcopy form that had to be updated daily and supplied to the branches. The terminal system has eliminated the hard-copy file updates because each teller can now access the data base directly with each inquiry, Neese said.

Tellers More Confident

"I know our tellers appreciate the rapid speed at which all information appears on the terminal," Rice said. "Since they have information at their fingertips, they are able to service customers faster and more efficiently," he added.

"Cape Cod Bank tellers also feel more confident in handling customer transactions, particularly when they are not familiar with the customer. All information appearing is continuously current, as the terminals are on-line to our NCE Century 200 computer. This system enables us to keep a file on every account and the account's activity," Neese said.

"Each time there is an input from a terminal on a certain account, that new information, whether a withdrawal, payment, etc., is recorded against that account and automatically updates that account's file. In this way, a teller can always be sure of having the correct information on hand.

Reports Read on Time

"With our many branches operating throughout the Cape, it had always been difficult to have all reports and trial balances delivered to the branches prior to their opening before the business day. With our Datatrol system, all the information necessary to conduct the bank's business is available when the bank doors open each morning. This not only saves time but money because of the fact data reports no longer have to be circulated," Neese said.

"It's easy to think of our Datatrol TPS-370 teller information system as a long wire tying all bank branches together with the beginning and end at the computer center," Rice said.

"Our operation efficiency relies on receiving data quickly and accurately, and it's imperative to have a technically modern system that will perform for you – we have that in our Datatrol system.

"After reviewing 18 months of operation, the system has shown it to be not only cost-justifiable, but an installation that will satisfy many of the future communications and operations needs of the bank," he said.

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☐ 733 ASR
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Transaction Value Another Factor

Cost/Transaction Seen Critical in System Evaluation

By Douglas Schilling
Special to Computerworld

Data flowing through a communications line might seem to be a transient, intangible commodity, but it is as large and as tangible as the next bill from the telephone company.

Network expenditure now represents a major part of the costs of any communications system and any information sent via a system must be evaluated to ensure it wouldn't be cheaper and more effective to transmit it by other means, if at all.

In this calculation, the critical parameter is the cost per terminal transaction – the money invested in the operation of the network divided by the number of terminal transactions through it. This unit cost should be weighed against the value to the user of that transaction.

In a network based primarily on a main central system, large quantities of data will be sucked into the CPU. Some of this data will be important, but much of it is likely to be of a realtively trivial nature.

Why Airlines Successful

One of the most successful centralized terminal network applications has been airline reservations because the average value of a ticket booked on the system is sufficiently high to make the unit transaction cost worthwhile.

Reservation systems for hotels have not been so successful because the unit cost of a room is far less than for an airline ticket and, therefore, less leeway is allowed in the cost per transaction.

With a distributed system based on a number of smaller computers at different sites, a closer control can be kept on the transmission of data.

For example, a software house is currently helping one of the top 10 U.S. commercial banks to design and implement a European network using twin Digital Equipment Corp. PDP-11s located at six cities – London; Paris; Frankfurt, Germany; Brussels, Belgium; Zurich, Switzerland; and Milan, Italy.

An interactive operating system and language will be used in the implementation as well as a message-switching system. Dual PDP-11s are being used to provide a standby capability at each location.

Every other potential terminal application is evaluated on the basis of whether the benefits obtained are worth the expense. For example, some of the bank's needs will be purely local to each country, and that information need not be transmitted to other centers except perhaps in summary form.

In the foreign exchange field, terminal transactions are usually valued in millions of pounds and so it is worthwhile to include a facility in the system to enable a local bank to check the files of other centers if it is felt the credit-worthiness of the client is in any doubt. This can be done from a terminal in less than a minute. Other low unit value transactions, however, will not be transmitted by the network because it might be cheaper to send them by mail.

The terminal transaction cost equation is one which should play an important role in evaluating the network design. The payoff point comes when the cost per transaction is less than about 10% of the value of the transaction.

If a bulk of the organization's transactions are going to be of interest to the whole system, as in an airline operation, a centralized system could be the correct one. Otherwise, a distributed network could cut down on the unnecessary traffic, making each transaction more profitable.

Another crucial factor in the choice of a network design is the amount of management control required at a terminal level and the degree of commonality in the organization's operations and procedures.

A few years ago, the creation of a central DP department to provide all the computer services for the organization might have seemed the only way of obtaining sufficient computer power at a reasonable cost to cope with the large workload.

But, as many companies have found, the central DP unit has often proved to be too remote – and not just in a physical sense – from the real needs of the company's operational units.

The flexibility of a distributed terminal network can be crucial. Flexibility is needed not only in bringing the computer intelligence closer to the management and staff who need it, but also in the way it can be implemented.

The implementation of a large centralized network can be a traumatic experience. The central design and programming teams have to try to integrate into a coherent framework the diverse needs of many different users, and the integration process itself introduces a technical complexity, say in setting up a data base, which can be an extremely difficult problem to solve efficiently and effectively.

A distributed terminal network, however, can be based on simpler design modules which can be developed at a local level in close contact with the relevant management. Of course there has to be a central design team to oversee the working of the whole network and to develop consistent standards throughout the system, but this team is likely to be small, highly expert and highly mobile.

In the bank terminal network mentioned earlier, work on the system is being done as a phased implementation, starting with London and Frankfurt and then proceeding to the other centers. The first applications being implemented – foreign exchange and loans and deposits – are those with the highest financial returns per terminal transaction.

Only about 10% of each local bank's work will be transmitted across the network, so once the local terminal center has been built and is running, the major battle has been won, with few of the problems of integration found in central systems.

Each center will have its own small local team of analyst/programmers who will work on enhancing and modifying local systems to meet any special needs within the overall supervision of the network design team, who will ensure local terminals meet the required network standards.

While a distributed terminal system gives a great deal of power to management at the local level, central monitoring of activities can be tightened by receiving summary reports of operations over any given period. Any information needed for central accounting or management functions can also be extracted from each local system when needed.

Common standards can help vendors make off-the-shelf terminal equipment, implementing in hardware some of the functions currently performed by software.

In the meantime, however, it is up to everyone implementing a terminal network to ensure for themselves that information is seen to be a highly valuable resource that cannot be wasted.

Schilling is vice-president and technical director at Arbat Systems Ltd. in New York, N.Y.

Polling Change Cuts CPU Utilization

(Continued from Page S/2)

and installed the automatic polling capability, which dramatically reduced the mainframe CPU time.

A given terminal will issue a positive reply to a polling request only about 1% of the time. Thus, if the host does the polling, it suffers the overhead associated with a repetitive, software-intensive operation.

The 3705 has the speed and capacity to handle the polling on its own and, in the modified system, the 3705 accesses the host only when a terminal has something to transmit.

Search Continues

SLH has not been entirely satisfied with Amcat performance, so an investigation into other terminals has been going on. The company is seriously considering replacement of the Amcat with the 750 transaction terminal manufactured by Concord Computing Corp. of Bedford, Mass.; the Concord terminal appears to be superior in several respects, according to SLH spokesman Robert Spicer.

The Concord 750 terminal has an alphanumeric feature, while the Amcat accepts numerics only. Also, the 750 generates its own transaction numbers, facilitating message validation and line quality monitoring by the host computer.

Further, the 750 has a time-out feature, permitting the terminal to disconnect itself from the line if a polling request hasn't been satisfied after a given interval, Spicer said.

He also cited the human factors aspects of the 750 design. It is a self-teaching machine, leading the operator from step to step, allowing relatively untrained personnel to operate the equipment without error.

The Amcats have been troublesome in this respect. The company has found it difficult to train Amcat operators, a problem compounded by a fairly high personnel turnover rate.

The 750 terminal also incorporates a flexible microprogram, allowing it to emulate a number of devices (including the IBM 2260) by replacement of a programmable read-only memory, Spicer continued.

The company plans to expand from 20 to 40 POS terminals in mid-August, so this has added impetus to the terminal trade-off study.

The new network is expected to handle 15,000 transaction/mo. The traffic count is 10,000 transaction/mo in the current system, Spicer said.

The encryption algorithm is employed on the lines between the 370 and the Burroughs machines. It is implemented in Assembler on the 145.

The encryption process adds very little burden to the computers, Spicer said.

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Banks Seen Turning to Terminals for Cash Management

By Leonard A. Goodman
Special to Computerworld

As a result of increasing technological awareness and sophistication on the part of banks and their customers, a new method for information transfer has come on the scene – computer terminals.

Computer terminals provide a fast and efficient way to deliver account information and instructions. Using terminals, a two-way communications link can be set up, transmitting relevant financial information to the customer and sending instructions to the bank that can be entered directly into automated processing systems.

As a communications tool, terminals offer many benefits, including: speed of data transmission, hard-copy output, reduction in transcription errors, reduction in clerical time and timely delivery of information.

However, to achieve these benefits and promote customer acceptance, the information transmitted must be of central importance to a customer's financial operations. Therefore, before designing terminal-based products, it is wise to review the general pattern companies follow in conducting their financial business.

Basic Questions

The bank cash manager has a number of basic questions to answer each morning.

One is how much money he has and where it is. To answer this question, cash managers and their staffs have to phone each bank and record balance information about their accounts.

Once received, this information is usually verified against internal company records to ensure accuracy.

Telephoning each bank is time-consuming. Often, a customer can't get through to the bank's bookkeeping department or an account officer for a readout of information.

In addition, since this information is transmitted verbally and recorded by hand, there is a continuing potential for transcription errors.

The next question a cash manager must answer is what should be done with the money. After the opening balance position is established and verified against internal records, the cash manager has to decide how to use the available cash.

Basically, there are four alternatives: invest, repay loans, pay bills or accumulate. Once a course of action is decided on, the cash manager will contact the banks and issue instructions that put these directions into action.

The next question is how to get the money to where it is needed. Whatever funds utilization decisions are made, they must be supported by appropriate account balances. This often requires that existing funds be redistributed among various corporate accounts.

One of the fastest and most widely used ways to move funds around the country is through money transfers. However, this forces the cash manager to get back on the phone to call the banks with transfer instructions.

The banks copy down the messages and enter them into the bank wire or Federal Reserve Wire Systems. Then, both the receiving and disbursing bank record the transfers and send advices to the customers.

The cash manager has now come full circle in the daily management of the company's cash position, back to checking balances and reconciling account activity.

To do this, the cash manager has to telephone the bank and have a clerk read the information over the phone or wait for advices and statements to come through the mail. This whole procedure is cumbersome and time-consuming, with a large chance for error.

In the past few years, Chase Manhattan and other banks have been developing a series of computer terminal-based information products designed to assist customers in the daily management of their cash positions.

These development efforts were begun at Chase in response to specific customer and competitive pressures and later enhanced as the result of a nationwide research study aimed at identifying customer informational needs.

Besides highlighting the techniques customers use in managing cash, the research served to pinpoint some valuable guidelines for the development of terminal-based information products:

- Virtually all customers surveyed required daily account information from their banks.
- Customers require highly descriptive account information concerning concentration accounts. General descriptions such as "money transfer" are unacceptable since they do not identify a transaction with the precision needed to reconcile an account.
- There's a definite time/value relationship to account information. Information is needed early in the morning so customers can place investment orders while trading in the money market is still active.

Banks must be sure the terminal-based products they develop are the products bank cash managers need, products that answer the questions cash managers ask each morning. Based on research and an understanding of daily cash management operations, Chase recently introduced a cash management system called Infocash.

Infocash is actually three separate computer terminal-based

(Continued on Page S/16)

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On-Line System Helps Vehicle Maker Operate Smoothly

CHULA VISTA, Calif. – Rohr Industries, a builder of transportation systems and equipment, employs an on-line communications system for production and management activities.

From the moment engineering drawings are released until a completed land, sea, air or space-vehicle system leaves the plant, Rohr's communications system is continually involved. The company uses four Memorex 1270 terminal control units (TCUs) to interface the computer center with the outside world.

More than 100,000 transactions are conducted each day using hundreds of terminals located throughout this plant and two other Rohr facilities in Southern California. "Of these terminals, 127 Teletypes and CRTs pass messages through the Memorex 1270s," according to Art Landman, chief of computer operations for Rohr.

The Memorex 1270s act as interfaces between the two separate mainframes, an IBM 370/168 and 360/65, and the remote terminals. The 1270 controllers are switchable between CPUs and any commonly used incoming transmission code or speed of the various communications terminals.

The terminals are used to indicate to Rohr personnel which jobs are to be performed, how they should be accomplished and where appropriate parts and tools are located.

The systems collect man-hour information, job status and job location data. In addition, the systems indicate the status of purchase orders and spare parts and allow on-line changes to parts lists.

The Automove system, one of the 11 on-line software systems in use at Rohr, is said to be one of the largest automated storage/retrieval facilities in the country. It controls shop load and material schedules within the company's detail-fabrication shop.

The Automove system hardware consists of 13 Teletype terminals, five CRT terminals and two General Automation minicomputers, all of which interface to Rohr's 370/168 computer.

A tool-operating system with five Teletypes indicates to users in seconds the location of tools, while also ordering and arranging their delivery when necessary to appropriate locations within the facility.

The Labor and Attendance System with five CRT display terminals, a printer and two Teletypes, record man-hour charges. The system uses audio response terminals – over 500 throughout the plant – for shop-floor labor collection.

Rohr Automated Data Acquisition and Retrieval (Radar) traces the flow of each job through the plant. The Remote Mechanical Planning System, with four display terminals at the Chula Vista plant and four more at Rohr's Riverside, Calif., assembly plant, stores and displays detailed manufacturing procedures.

Scientific computing tasks are handled through the 1270 controller using two keyboard terminals at Chula Vista, plus one terminal printer at the Kearny Meas, Calif., division.

A finished parts inventory system holds inventory data, while the Engineering Parts Release System with four CRT terminals is used to make changes to engineering parts list. The Spares System, used for keeping track of spare parts orders, employs a Teletype.

The system is in use seven days a week and 24 hours a day. In addition, the company leases computer time service to other companies via the Rohrdata Systems Division. One large application involves 14 additional terminals connected through the 1270 controller to the CPUs.

All communications are in Ascii and Ebcdic transmission codes at varying speeds, depending on the type of terminal used. Speeds range from 110- to 4,800 bit/sec over private line facilities.

Eleven separate Rohr activities are connected to the system through the Memorex 1270 controllers, which feature a diagnostic capability that enhances troubleshooting and speeds system restoration in the event of a network failure.

"The main factor in purchasing the Memorex controllers was cost savings," Landman said. "The compact, modular units support synchronous and asynchronous lines, and the diagnostic panels make possible on-the-spot system restoration by aiding in locating faulty system addresses," he added.

Basics Often Ignored In Selecting Gear

(Continued from Page S/2)

pliers whose equipment meets the operating, growth and service requirements that have already been determined.

In this instance it is much better to prepare a functional specification of the desired features for the terminal and the operation it will be used in together with a location list indicating volumes of transmissions for each.

While the specifications should firmly indicate all those features that are considered mandatory on the terminals, it is wise to allow the vendors some latitude to suggest options which may be unique to their terminals.

Also, if the list has been reduced to only several vendors, it would be wise to request they provide the cost of any network configuration they recommend for their terminals to transmit the indicated volumes within the required response time parameters.

This design will have to be verified as to accuracy and cost-effective alternatives such as competitive data sets, use of existing corporate networks, etc.

However, in the initial review, this information will prove valuable to the system designer.

Once all of these mundane and seemingly simple areas have been covered, it is possible to begin the journey into the never-never land of line protocols, and the other areas of the forest where the user can lose sight of the trees.

However, until it is established that the vendors can install, service and support the installation and that the users will interface with the terminals in a manner that will result in effective operation, such things as cost and technicalities are all academic.

Management doesn't care about technicalities. Management cares about whether the system works and what the net bottom line effect is. If either of those criteria fail, the best project, no matter how sophisticated, will also fail.

Kuehn is a consultant and president of RAK Associates in Cleveland.

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News item . . . Vadic announces that General Electric Instrumentation & Communication Equipment Service will lease, install & maintain Vadic's VA3400 full duplex 1200 bps modem through their more than 50 terminal service locations.

What this means to time sharing companies

Now you can offer true full duplex 1200 bps service to dial-up customers without worrying about leasing, installing, or maintaining the modems. General Electric Instrumentation & Communication Equipment Service will do this for you. And since Vadic's miracle modem uses exactly the same line discipline as Bell's 103, you can change computer port speed to 1200 bps in minutes.

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Firm's System Helps Meet Power Plant Report Needs

SAN FRANCISCO – To meet the reporting requirements laid down by such agencies as the Nuclear Regulatory Commission, an engineering and construction firm here has implemented an automated Document Control System that logs, tracks, sorts and indexes relevant communication relating to power plant construction – even key telephone conversations and interoffice memos.

The San Francisco Power Division of Bechtel Power Corp. is deluged daily with hundreds of communications, many involving changes in equipment specifications that demand prompt and thorough attention.

The system is built around a Hewlett-Packard (HP) 3000 computer with 128K bytes of memory which employs 22 remote HP 2640 interactive display terminals for data entry.

With a single keyboard entry, all project information is permanently recorded and can be instantly retrieved. Items requiring response cannot be overlooked since the computer generates periodic reminders until the matter receives the appropriate action.

Bechtel's system not only facilitates day-to-day transactions, but constructs a complete history of drawings and project correspondence.

Bechtel's division office here first tested an automated Vendor Print Control system in March 1972 on a time-shared HP 2000F minicomputer.

Previously Impossible to Read

The progress of vendor prints, or engineering drawings, had previously been logged manually in pencil on vellum sheets.

Often, if a project ran several years, the first year of entries on the vellum sheets became physically impossible to read. The increase in the construction of nuclear power plants, which use up to 20,000 vendor prints in the course of construction, soon made some form of automated document control a necessity.

The first experiment led to the rental of an HP 2000F in November of the same year. Twelve months later, Bechtel planners decided to lease the present system.

The Bechtel system includes two 47M-byte disks, a 2M-byte fixed-head swapping disk, two 16-port multiplexers, a 1,600 bit/in. tape drive and a 200 line/min printer.

All data entry into the central computer is accomplished at 300 bit/sec on the display terminals – one located in Los Angeles and the rest distributed among three Bechtel buildings in San Francisco.

Clearinghouse for Drawings

Bechtel's Vendor Print Control system serves as a clearinghouse for all engineering drawings associated with each power plant under construction.

Each print is tracked through all revisions until it is approved for construction, thus enabling project supervisors to know the location of a print and its state of approval.

Drawings from all disciplines, from civil and mechanical to nuclear engineering, are routed to the appropriate document control center where a clerk enters all the relevant information through the terminal keyboard by filling out a 130-character formatted CRT display.

Once a print is logged in and assigned an identification number, an aperture card for mounting film copies is automatically punched out.

A senior operator at Bechtel Power Corp., William Liu (foreground), checks system status as Eric Sandberg, a support analyst, studies the nightly report printouts.

This data card is attached to the drawing and, before it can be logged out, it must be sent to micrographics where the appropriate number of silver originals and diazo copies are made.

Communications Registers

The success of the Vendor Print Control prototype encouraged Bechtel programmers to move toward an automated communications register.

Like the engineering drawings, all project correspondence is read by clerks in the control centers, logged in through the CRT and assigned a sequential numeric document control number.

The logged documents are then filed chronologically by control number and are often cross-indexed up to five different ways. This chronological file, which is filmed and archived on a preprogrammed basis, serves as a complete historical record of the project. Various indexes to the film file are automatically generated off the HP 3000.

Like the vendor prints, project correspondence used to be logged manually, but it was simply a sequential data index. If a supervisor wanted a record of letters, it meant a lot of time-consuming work.

With the computer, the data is logged only once and can be sorted and retrieved according to need.

A Bechtel programmer analyst has noted that the CPU can generate a complete list of all action items due within 24 hours in about ten minutes for about a $5 computer cost.

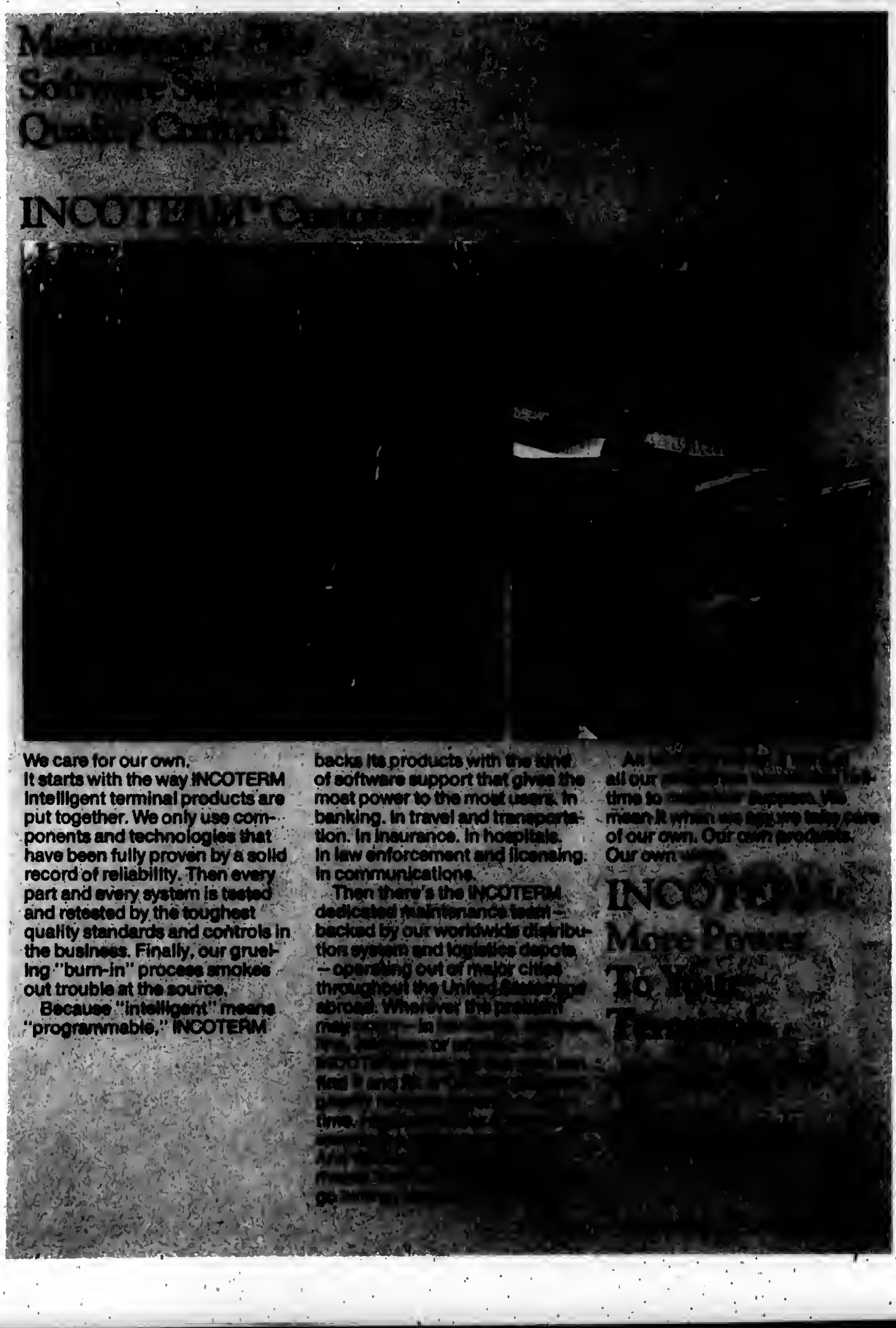
Before, it would take several hours to do the same job – at 15 times the computer cost.

Both the vendor print and document control systems are arranged in a master file/transaction file orientation. All searching is done on the master file, but writing is done on the transaction file to avoid accidental data loss.

At night, all new information is sorted and merged into the master file, and a fresh transaction file is created.

Programmers remove the system from on-line service twice a day and dump all data to tape. By completely backing up the master and transaction files, the

(Continued on Page S/14)



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Distributed System Cuts Firm's Inventory Paperwork

MONTVALE, N.J. – A 24-terminal distributed processing system is helping Benjamin Moore & Co. process orders, monitor product inventory and coordinate production at 10 of its manufacturing locations around the country.

The company, which manufactures paints, stains, varnishes and related products, sells through a network of thousands of independently owned retail outlets nationwide.

Each of these dealer outlets places its orders at one of 10 regional service plants where they are processed, packed and quite frequently ready for shipment the same day.

The paperwork load is enormous, however, since the company produces many different products, each available in a variety of sizes and colors. So the possible product descriptions – and chances for manual error – are many.

The company was faced with the need to update its current equipment for the benefit of both the central DP sites in Montvale and Chicago and the 10 plant locations, according to William J. Fritz, corporate controller at Benjamin Moore's headquarters here.

"Several of our requirements were typical for a distributed processing system," Fritz said. "We wanted to replace the existing tab card filing system; thereby eliminating the keypunch and key verifying procedures at the two host computer locations.

"We also needed a system capable of minimizing errors and simplifying error correction both at the computer sites and at the plant locations.

"Other special requirements made the search for the right system rather intensive. The chief requirement was disk storage rather than cassettes. The seek time on the Raytheon Co. PTS/1200 random-access disk proved to be very attractive. Large disk storage capacity was also needed because of the number of variables in our ordering data. The PTS/1200 gave us more than 5M bytes, thereby eliminating several other competitive systems.

Sorting a Consideration

"Another important system parameter was sorting ability. Since our Newark facility was already operating on a presorted order system, it was our intention to upgrade all 10 locations to a similar system.

"There were also additional requirements we demanded of the new system such as remote printing capability at Newark. Montvale is the only nonfactory location and operates in tandem with the Newark factory to process orders.

"One of the most important considerations and the one that sold us on Raytheon was its ability to fill our need for a financially sound supplier with service locations nationwide," Fritz said.

The system, which has been fully operational since last September, includes 24 intelligent terminals: two at each of seven plants; three in Chicago and Milford, Mass.; and four at Montvale. It also includes 11 165 char./sec printers, one at each location plus a remote printer at Newark and a 5.2M-byte disk storage capacity at all 10 sites.

The three primary functions of the Benjamin Moore & Co. system are order entry, editing and inventory control/production planning. Order entry is handled by the keyboard operators at each location by selecting an order entry program. The format appearing on the screen is a duplicate of the printed order form. After the operator enters the customer's account number and checks it, all pertinent data on that customer is displayed from disk memory.

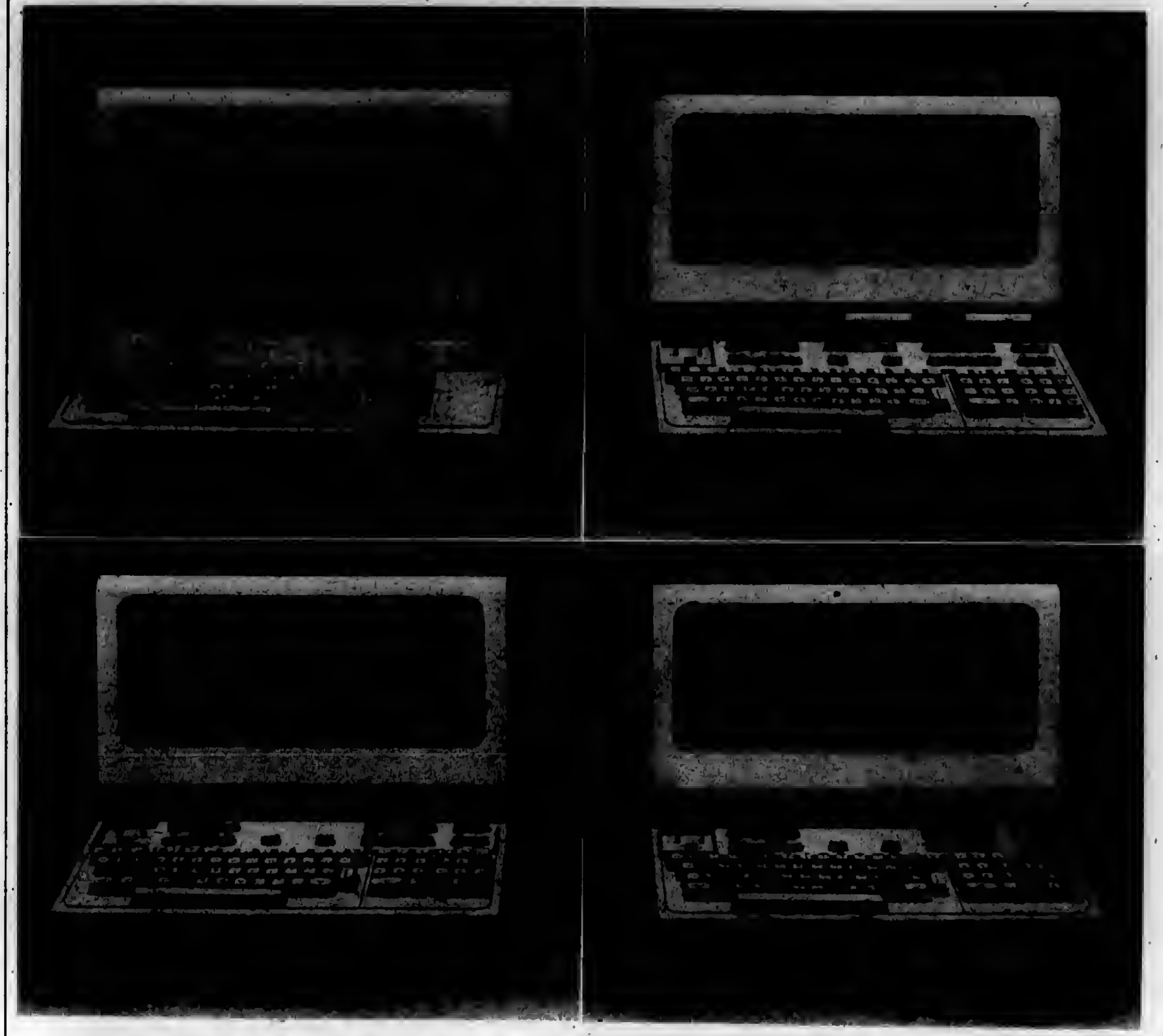
Each product is then entered with each item assigned a three-digit product code, a two-digit color code and a one-digit size designation. The item description is displayed from disk memory, so the operator can visually verify the line items by comparing the retrieved description on the screen with the hard copy.

After the order is completed, the operator releases it for automatic sorting into a numerical stock-picking sequence. Within seconds, the high-speed printer creates the required paperwork and shipping memo.

At the end of the daily cycle, all the orders processed by each plant are automatically retrieved by the data centers for central billing and accounts receivable input.

Unattended transmission is handled after hours via phone lines, with the host computers dialing each plant in turn. The PTS/1200 automatically answers the call and transmits its daily

(Continued on Page S/16)



FORM FITTING.

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Then, from the same keyboard, add in protected fields as further assurance that the right information won't wind up in the wrong places.

For still greater operator convenience, you may want to lock in form headings – while the data under them is continuously updated and transmitted to the computer. Or use inverse video, optional half-brightness, underline, or even blinking characters to clarify where information goes and what musn't be forgotten.

The Hewlett-Packard 2640 terminal series offers, in addition, powerful local editing and formatting capabilities. Modular design. Built-in self-test. An unusually readable display. Optional character fonts (you can even design your own). Or, choose the 2644A Mini DataStation for the same features in a terminal with mass storage capability for stand alone operation and the convenience of two 110,000 byte, pocket-sized data cartridges.

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CRTs Help Company Keep Track of 3,000 Rail Cars

WILMINGTON, Del. – To address the difficulties facing shippers using rail cars, many companies are now turning to the computer as a tool to increase the productivity of the traffic department as well as improving rail car utilization. One such company is Hercules, Inc.

With its mixed fleet of over 3,000 cars, the firm must use its rail cars effectively.

The ledger card system the company used until the late '60s was designed primarily to indicate where a car had last been sighted. As the number of cars grew and the responsibilities of the Traffic Department expanded (it now owns the cars and provides them to the company's various plants), major difficulties became apparent...

The manual system allowed little time for anything but posting current car locations, and it provided none of the data the department needed to manage the growing fleet more efficiently.

To eliminate these difficulties and address the growing list of problems confronting shippers, Desmond Farrell, director of traffic, and Reid Nurenberg, director of the Management Information Department, agreed on a computer-based system using visual display terminals and printed reports to quickly provide the users with a wide variety of current information on Individual cars. These include the latest reported location, a full maintenance history and extensive financial information on each car.

Saved $500,000

Farrell cited several benefits of having such a system. In one particular case, he noted, "the computer system assisted us in reducing a planned purchase of new cards from 200 to 164 cars," for a one-time savings in excess of $500,000.

The Traffic Department is now free to spend more time managing the fleet since it no longer handles as many clerical chores.

Also reimbursement for mileage earnings has been more accurate since a complete record is maintained on each car movement.

Maintenance costs have been reduced as a result of better analysis of the repair histories on each car.

Another benefit is that detention time by individual customers can be monitored more closely with the computer system.

The system developed by the Management Information Department uses several files, or data bases, of information. The major component is the rail car data base, which includes all necessary information on each car in the fleet.

Other files include the route data base and the location data base, as well as those data bases in the order entry system. Input to the system is in the form of Car Location Messages from the railroads; ship/receive notices from the plants and other information entered by Traffic personnel – such as rental data, repair costs and maintenance data.

This data can be entered into the system through on-line CRT terminals. Almost all reports the system produces can be obtained through both display terminals and printed reports. The entire Rail Car Management System runs under an IBM program called Information Management System (IMS).

The data bases are stored on a number of IBM 3330 disk drives, which enables Hercules to retrieve needed information. Rail car data is available during normal business hours – from the start of business on the East Coast to the close of business on the West Coast. During this time, about 2,000 daily transactions – both data entry and inquiry – are handled through a network of 180 IBM 3270 terminals, which are also used for other applications. They are linked by private phone lines to an IBM 370/168 at Hercules' DP center in Wilmington, Del.

Daily input transactions include 700 car location messages from the railroads, shipping notices and several hundred miscellaneous transactions. Most are handled on-line and by Traffic and Shipping personnel rather than by DP personnel.

In addition to being displayed on a 3270, system output can be processed for a high-speed printer or left on disk storage for later use. The printer is most commonly used to produce reports for management, while the display terminals are used to handle data needed to operationally control the fleet.

When one of Hercules' plants has a shipment ready, it contacts the local railroad office and arranges to have the loaded car shuttled onto the main line. At the same time, the shipping department usually calls a form onto the screen of the 3270 terminal and keys in the car number and other shipping data.

As the car moves onto the line, it passes an optical scanner which reads the car number.

Any car unreported by a railroad for three days comes up on Hercules' "Overdue for Railroad Report." Traffic then calls the railroad last reported to have the

(Continued on Page S/15)

While Reducing Costs

Terminals Help Manage Aluminum Firm's Production

HANNIBAL, Ohio – A production control system embodying sophisticated DP terminal concepts is in operation at Consolidated Aluminum Co.'s aluminum sheet and plate manufacturing facility.

The control system has reduced costs and has helped to achieve improved overall management, according to Keith C. Phares, director of corporate information services for Consolidated Aluminum.

The Hannibal plant, with an annual capacity of 125,000 tons, produces 60% of the entire company production of sheet and plate aluminum. Other rolling mills are located in Madison, Ill. and Jackson, Tenn.

The Univac 1106 installed at the Hannibal DP center in January 1974 performs batch processing, remote batch processing, communications, real-time processing and demand terminal processing on a round-the-clock basis, seven days a week.

Equipped with a main memory of 262K words, the 1106 has a mass storage capability consisting of eight Univac 8424 disk drives with a total capacity of 466M bytes, four Uniservo 16 magnetic tape units, two Univac 9300 computers for input/output to the 1106, a CTMC communications subsystem with concentrators and signal converters.

The 1106 data base contains files for customer information, product information, standard cost data, open orders, order status, lot status, accounts receivable and invoicing.

Three main functions – production control, standard cost (production and material standards and production sequences) and a data reporting system – are performed by the 1106 for the Hannibal plant operations.

Linked via a 4,800 bit/sec communications link to the 1106 is a Univac 9800 computer system in St. Louis, Consolidated Aluminum's corporate headquarters. A software program, known as RM-94, is used to handle transmissions between the 9480 and the 1106.

Data lines also connect the 9480 system with IBM 3741 data entry terminals installed at seven other company plants. These terminals transmit data used for processing order entry, payroll, stock status and general accounting applications.

In addition to the 9480 connection, the 1106 is linked via data lines to two Univac DCT-475 data communication terminals, one at Hannibal and the other in St. Louis; 55 Data Gathering System (DGS) terminals installed at production stations throughout the Hannibal plant; and eleven Uniscope 100 visual display terminals installed in various departments at Hannibal.

Another data line connects the 1106 to a Mohawk Data Sciences Corp. terminal network connecting other plants.

Terminal Locations

Five of the Uniscope 100 visual displays at Hannibal are located in the production areas (hot rolling mill, cold rolling mill, etc.), two in production control and one each in the maintenance, metallurgy, systems and stores departments.

The 1106 replaced two Series 70 (RCA Spectra) systems which were previously used for production control at Hannibal.

Because of the "real-time" nature of the operation, the cutover to the 1106 from the Series 70s was done without any parallel running of programs.

The conversion to the 1106 was one of the first installations in the U.S. to have converted from a Series 70 byte-oriented machine to an 1106 word-oriented computer and was done without the existing array of Univac conversion aids.

It was also one of the first major manufacturing applications for Univac's Transaction Interface Package (TIP) designed for 1100 series computers. The Hannibal plant application of TIP was a joint development venture between Consolidated Aluminum and Univac.

TIP provides the 1106 with an efficient on-line communications-oriented processor operating under control of the 1100 operating system. It is basically a transaction-driven scheduler. An identifier in the terminal input message defines which transaction program will be scheduled for processing.

TIP file control provides the transaction with quick access to the data base without dynamic file assignment: the entire base, in effect, is permanently assigned to transaction programs.

A Communications Management System is part of TIP and provides real-time interface between remote communications

(Continued on Page S/16)

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

If you've considered the advantages of distributed data entry and processing, you've probably discovered a sad truth:

A system that's fine for Poughkeepsie might be a washout in DesMoines.

Different sites have different needs. From remote data entry, to communications, to remote inquiry and response, to on-site report and forms generation.

And to overwhelm a small branch with high-powered equipment is just as bad as under-equipping a large one.

To match each of your branches with exactly the right equipment, in both hardware and software, there's only one terminal manufacturer to turn to. Us.

We're as flexible as you are.

Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

Our Model 350, for instance, might be just the ticket for your two-man operation in Des Moines. While a larger branch in Los Angeles might require the concurrent background processing capabilities of the Sycor 440.

And, while each of the three terminal systems has its own unique capabilities, they all work together in a remote processing network.

Each, for example, can be programmed with our high-level, easy-to-use TAL language. And, they not only talk to your CPU, but to each other.

And that means flexibility.

Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

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Firm's Terminal System Meets Power Plant Reporting Needs

(Continued from Page S/10)

center can lose no more than four hours of data in the unlikely event of a hardware failure.

Daily and monthly reports on a project's progress are generated by the computer overnight on a low-speed printer. Programmers build a request file from project inquiries on magnetic tape which is then run in the batch mode on the computer after the office closes. By morning, the latest reports are ready for distribution.

Client Service a Bonus

Clients, in particular, have become beneficiaries of the system. Copies of outstanding action item reports for Bechtel/client matters are sent to clients on a regular basis.

These reports supplement the client's own reporting system and have been lauded by many as a tribute to Bechtel's thoroughness.

One real advantage of the company's system, according to spokesmen, is that it can be entirely maintained by a clerical staff with little or no specialized computer training.

Depending on project size, up to 10 clerks run each document control center with only occasional programmer intervention.

The average clerk learns the entire data entry system in about one day. Mistakes are easily detected and corrected through transaction printouts which are sent every morning for verification.

Plans are currently in the works to streamline the system even further. Programmers are considering going to higher speed modems – from 300- to 1,200 bit/sec. This will decrease the time it takes to enter the same amount of data and allow clerks to display and store data much faster. Programmers estimate this change will increase throughput another 30%.

Terminal Lines Disappearing

(Continued from Page S/3)

the lack of power or sophistication available from terminal manufacturers. Now that position has been reversed; it is quite easy to overpower an application with a terminal system offering very sophisticated capabilities.

There is also a trend to replacing all nonintelligent terminals with intelligent devices, even in the absence of a real need. The upshot of this whole situation is the replacement of uncomplicated, straightforward terminals with newer, more powerful, higher cost terminals that are doing little more that the ones replaced.

Much of this swapping out is in anticipation of the need to support the new line protocols.

However the protocol stampede is not as widespread as it is purported to be. Most of the newer terminals offer the older forms of line protocols in addition to the newer ones and, until the smoke settles on the issue of protocols, the need to change is applications-dependent.

Callahan is managing editor at Auerbach Publishers, Inc. in Pennsauken, N.J.

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Links Insurance Firms to Bureau

Portable Units Allow Salesmen to Make More Calls

NEW YORK – Access to a computer through portable terminals linked to a time-sharing firm allows life insurance salesmen here to spend more time calling on prospects and less time doing routine calculations.

Also, they can bring the power of a Digital Equipment Corp. Decsystem-10 directly into a client's home, office or place of business.

"The portable time-sharing terminal opened up a whole new way of selling life insurance," according to Charles Shoten, president of Insurance Sales Support Systems, Inc. (ISSS), the service bureau.

"Because service is the key ingredient to successful selling, having access to a computer is essential. Naturally, the portables that have been around for several years have made it easier to get information during a sales presentation. But at 25 pounds or so, carrying a terminal around seemed like a lot of extra work."

"Now, however, there is a definite trend to lighter, more flexible machines. And for those salespeople who are resourceful, aggressive and can get around to see a lot of people in a day, these new terminals – such as Computer Devices, Inc. (CDI) Miniterms (about 15 pounds without carrying case) – can make the work day a lot more pleasant."

"The best part of using a portable terminal and the ISSS system is there is no need for a DP background.

"With the ISSS system, all the salesmen must know how to do is sell life insurance. All the help he gets from the computer is automatic – no special computer training or expertise is required."

The Insurance Sales Support System shows in black and white on a year-by-year basis the cost of the proposed insurance-investment plan and its benefits, tax advantages and estate values. This immediate and comprehensive report allows the life insurance agent to show his prospective buyer exactly what is being proposed, enabling him to make the optimum sale with a minimum of cost, time and effort.

No agent, no matter how highly trained, can hope to do the kind of financial manipulating a computer can do. The ISSS approach puts a computer into the salesman's office or into the client's home. The sales illustration the computer prints out specifically for the client is the key to more and larger sales for any agent.

ISS offers several different terminal models to its users. One is the CDI 1030 Teleterm, which operates from 10- to 30 char./sec and weighs under 25 pounds. With this type of terminal, the salesman has access to the ISSS system wherever a telephone and ordinary wall outlet are available.

In addition to easier handling, the CDI Miniterms are extremely rugged. Salesmen are generally in and out of cars all day long. Portable terminals naturally take a lot of abuse being dropped into car trunks or onto automobile floors frequently.

"A major factor in the selection of a portable terminal is quiet, unobtrusive operation," Shoten said. If a presentation is being made in a client's office, the terminal should not create a disturbance.

Company Keeps Track Of 3,000 Rail Cars With Help of CRTs

(Continued from Page S/12)

car and soon a message comes back.

This message is entered into the CPU, the necessary maintenance is performed and the car resumes its trip. Meanwhile, the customer may also be advised of the delay.

Access to System

Any authorized Hercules employee concerned with production, transportation or customer service can ask about cars or shipments through one of the display terminals. Most inquiries from the field concern the status of shipments.

The customer representative can begin his inquiry with either a customer code or the number of the order he wants to trace, Nureberg said. Both retrieve similar information: shipment date, product carried, plant, route, destination and carrier, where the car is located now, its status, and the time stamp on the latest report.

Micon Adds Options, Cuts Pocketerm Price

OAKLAND, Calif. – Micon Industries added three optional features to its one-year-old Pocketerm portable keyboard/display interactive terminal and reduced the price of the basic terminal.

Pocketerm has a full Ascii alphanumeric keyboard, 32-character LED display, an acoustic coupler and a rechargeable power supply, according to the vendor.

The first option which can be added to the unit is a removable miniature tape cassette called Cassetterm which is said to permit display, storage and transmission of up to 40,000 alphanumeric characters.

Control Methods

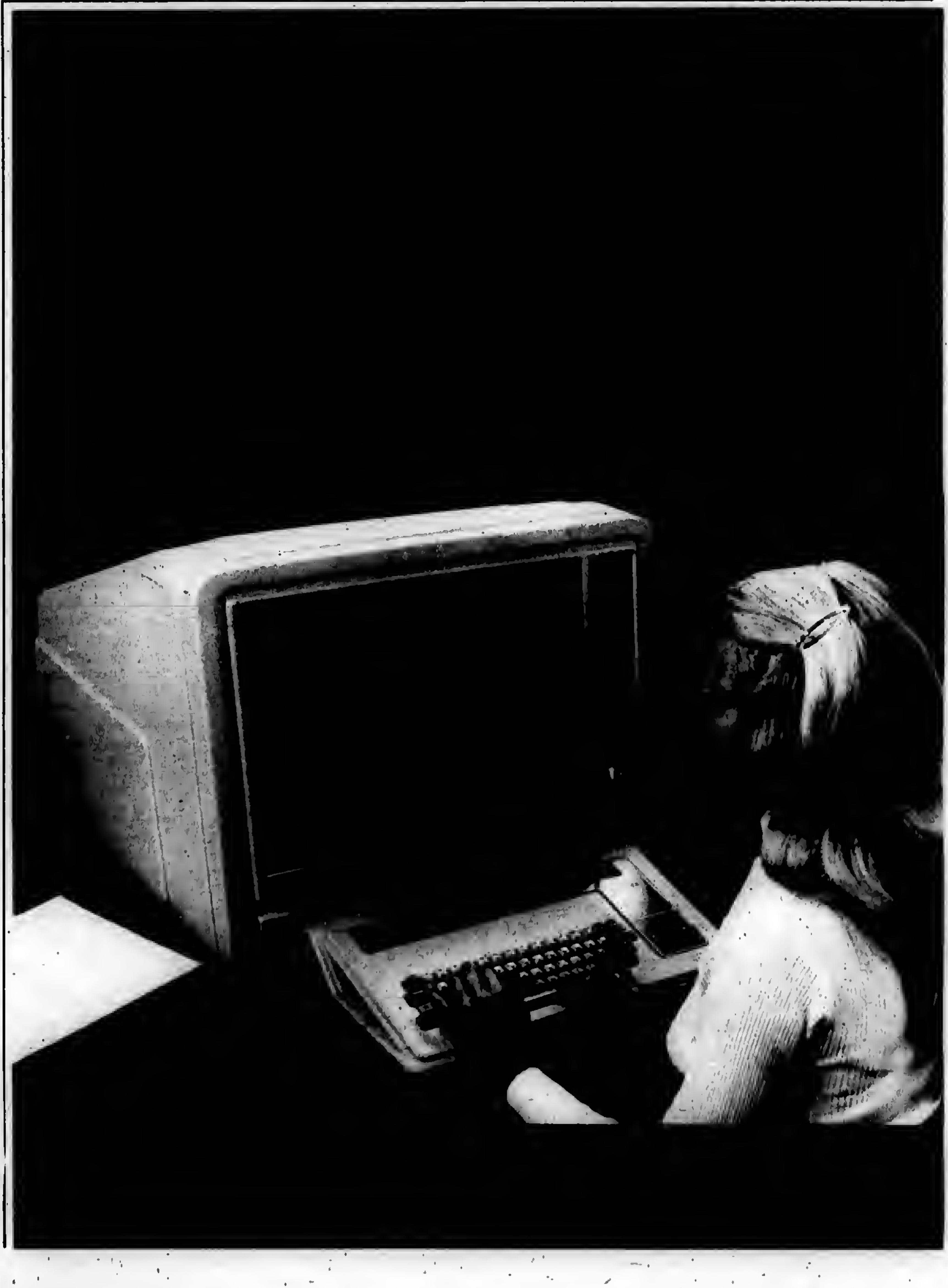
The Cassetterm can be controlled from the terminal keyboard, through a host computer system via the terminal's acoustic coupler or through a TTL interface, according to a spokesman.

An RS-232 interface and an optical pattern reader (OPR) are the other features introduced for the Pocketerm.

The OPR reads an infrared pattern code buried in a user's identification card and transmits the information to a CPU, for example, to allow access to confidential information, Micon said.

The basic Pocketerm has been reduced from $1,200 to $995; the Cassetterm and OPR options cost $500 each; and the RS-232 interface feature costs $200, the spokesman said.

Delivery is 30 days, Micon said from 252 Oak St., Oakland, Calif. 94607.



Terminals Help Manage Firm's Aluminum Production

(Continued from Page S/13)

devices and the transaction processing system.

One of the key systems handled by the firm's DP complex is Order Entry. The system provides a single focal point for order processing, status and control. It has reduced clerical costs and human errors and yielded better customer service.

In operation, orders are received via telephone or mail by customer service representatives in St. Louis. They are then recorded on sales order worksheets and sent to the Code Control Section.

After processing by Code Control, the orders are sent to DP to be keyed and verified following which they are transmitted nightly to the 1106 system in Hannibal.

The Hannibal Center edits the orders for valid coding (customer codes, product codes, etc.) and performs a credit check. After this procedure, the orders are added to an open-order file which is used later for billing purposes.

Following processing through the order entry computer programs on the 1106 system, the sales orders, edit listings and credit hold reports are transmitted back to St. Louis.

Orders to be manufactured at plants other than Hannibal are transmitted to those facilities via the Mohawk terminals linked to the 1106. Factory orders are then printed and distributed to the production scheduling section which prepares packing lists, bills of lading and other necessary documents.

The computer produces lot tickets for each operation in the production sequence. As each operation is completed, the computer is informed by a message transmitted from the Data Gathering System (GDS) terminal at the site.

In operation, the operator on site inserts the punched card accompanying the material, already numbered by the computer, into the terminal which identifies itself to the 1106 system by location and cost center. The operator also inserts his badge into another part of the terminal, which identifies the operator to the computer.

Additional Applications

The operator then keys in on the terminal's 10-digit keyboard the variable data, the sequence of the operation performed, the weight of prime material produced and information required to generate a production standard. The terminal time-stamps the transaction with the date and finishing time of the operation.

Similar reporting is performed by all the DGS terminals along the entire production route taken by the order so the computer is able to keep track of every order.

Additional corporate-type applications will be developed in St. Louis which can utilize the 1106 system's capabilities, Phares said.

Despite the sophistication of Consolidated Aluminum's data processing operations and the wealth of production control and other management information received from it, the costs of the company's DP activities have been kept well under control, Phares said.

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Banks Seen Discovering Terminals to Manage Cash

(Continued from Page S/7)

products which fit together to form an integrated cash management system. Each of the products — Regional Balance Reporter, Money Transfer Input and Cash Reporter — was specifically designed to address the cash manager's questions.

Software for the Infocash system was developed by Interactive Data Corp. Banks using the system access the Interactive Data time-sharing network using 10-, 15- and 30 char./sec terminals.

Regional Balance Reporter

Regional Balance Reporter answers the questions of how much money there is and where it is. It acts as a central collection point for balance information provided by banks across the country. In effect, Regional Balance gives the cash manager one place to go for a comprehensive picture of a company's cash position.

How to get the money where it is needed is taken care of by the Money Transfer Input Service. This provides cash managers with the ability to initiate repetitive-type money transfer transactions directly from their computer terminals.

Detailed descriptions of each transfer are provided by the system as acknowledgement that instructions have been received.

Cash Reporter provides detailed transaction information on accounts at Chase. Each morning balance and activity information is extracted from the Chase-Demand Deposit Accounting System and entered into individual company files.

Available at 9 a.m.

This information is available to customers shortly after 9 a.m. Cash Reporter also provides advise-like descriptions for every domestic money transfer.

Currently available products have only begun to scratch the surface of what can be done in cash management. For instance, the expanding role of multinational corporations might prompt the development of international cash management products.

On the domestic side, continued customer demand for up-to-date information might lead to an expansion of present reporting capabilities from prior-day information to same-day information. Given economic justification, the possibilities for future development are constrained only by the customer's need to know where the money is, how much there is and how it can be moved around.

Goodman is senior payments development officer at Chase Manhattan Bank in New York City.

System Cuts Paperwork

(Continued from Page S/11)

files. Management reports including territory product gallonage summaries and other information are important by-products of the system.

Edited Locally

Editing is handled locally by the system and each plant has the flexibility to edit on the same terminal used for order entry. When an order has been shipped with adjustments such as size change or routing instructions, the shipping memo is returned to the operator who updates the billing and inventory files.

Once a day each plant enters the production totals from the previous day — products, colors, sizes and quantities. This enables the computer centers to maintain a continuing "inventory" of each item. A hard-copy report is then printed for each factory location to use in its production scheduling.

Fritz sees the major advantage of the PTS/1200 system as its ability to give the branch locations total system autonomy while keeping the central computer location informed on a day-to-day basis.

"The system has also reduced our transmission time by more than two-thirds," he said, "a factor which is becoming much more important with the change in Wats rate schedules.

"Another major advantage from our point of view is the system's ease of operation and its flexibility for future expansion," Fritz said.

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Network Helps Five School Districts Balance Budgets

CONTRA COSTA COUNTY, Calif. – Five school districts in the East Bay area across from San Francisco are keeping closer tabs on actually incurred vs. budgeted expense items and other aspects of day-to-day financial management through the use of a multiterminal network.

The system is based on the Datapoint Corp. 5500, a typewriter-sized computer located in the county superintendent of schools' headquarters. It provides DP power over standard dial-up telephone lines to Datapoint 3360 terminals located in outlying school district facilities.

The 5500, in effect, serves as a "computer utility" for users at the terminal units in the "remote" school district offices which can be used to access both the computational power of the processor and the data storage capability.

The Datashare installation provides these computerized services to independent school districts on a prorated cost basis, permitting them to have on-line computing power that would otherwise be economically impractical.

The school administration was one of the first Datashare system users anywhere, having installed a 2200-based system with three cartridge disk units for storage and a servo printer in August 1973.

Because user demands were growing, the county switched over in late 1974 to its present 5500-based system which offers more power and has the potential to service up to 16 remote terminals, compared with eight for the 2200.

At the same time, the county exchanged the three cartridge disk drives used with the 2200 system, each of which could hold up to 2.5-M bytes of information on replaceable cartridges for two mass storage 2314-type disk storage units, each of which can handle up to 24M characters of information. The 5500 also utilizes a 300 line/min printer in place of the initial 30 card/sec servo printer.

An example would be a school district that wants to use the on-line service to obtain current information for a high school's Industrial Arts Department, which has been allocated $1,000 for parts during the 1975-76 school year. Suppose that on January 20, 1976, an operator keys in the query and the appropriate file information on the 3360.

In a few moments the display screen might come back with the following information: As of 10 a.m. on January 20, 1976, the Industrial Arts Department has spent $430.50 and has ordered an additional number of parts costing $385.20. This means the department now has an unencumbered balance of only $184.30.

In this case, more than 80% of the budget has already been spent by January 20, and the district can now consider the implications of this discovery.

School district staff members using their on-site terminals can also get computerized calculations of California Senate Bill 90 revenue limits (which determines school district-spending formulas) using variables such as average daily attendance, teacher retirement expense and estimates of miscellaneous income.

S. 90 revenue limits must be recalculated almost weekly because of these variables and, hence, the handiness of the on-line service. Assessed valuations for school districts are also calculated with greater ease by means of the computer, which incorporates factors supplied by the County Auditor's Office.

Other Uses

The terminal system has other uses in addition to providing current financial information. It has been used for the Contra Costa County Comprehensive Plan for Special Education in developing programs and data to be further processed by another, larger computer in the Mt. Diablo Unified School District.

It has been used by the Area Vocational Planning Committee, which publishes an inventory of vocational education programs offered in Alameda and Contra Costa Counties, based on information supplied by public and private schools and colleges.

The information can be easily updated each year and the on-line, instantaneous retrieval of information about vocational education makes the system unique throughout the state and even the nation.

Batch Processing

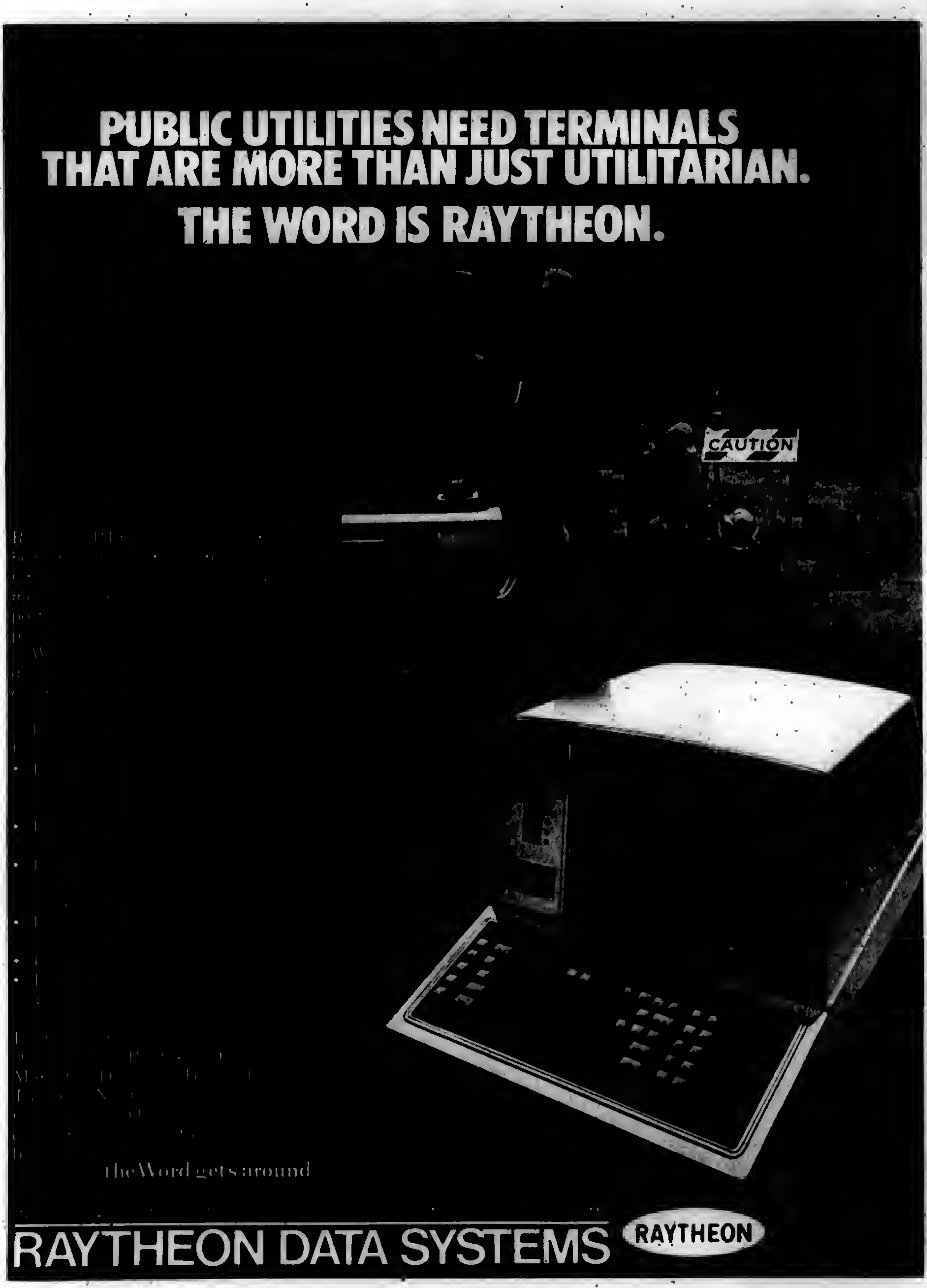
At the same time that remote users are utilizing on-line access to the 5500 and its storage units, the system may also be used for batch processing work by the county's home office administrative staff.

These batch applications include updating of files, generation of management reports and statistical sampling. Programs for both remote use and home office batch mode are written in the Datashare language.

The county also uses a large IBM 360/50 system in batch mode for class scheduling, payroll and other administrative processing.

Data tapes on individual school

(Continued on Page S/20)



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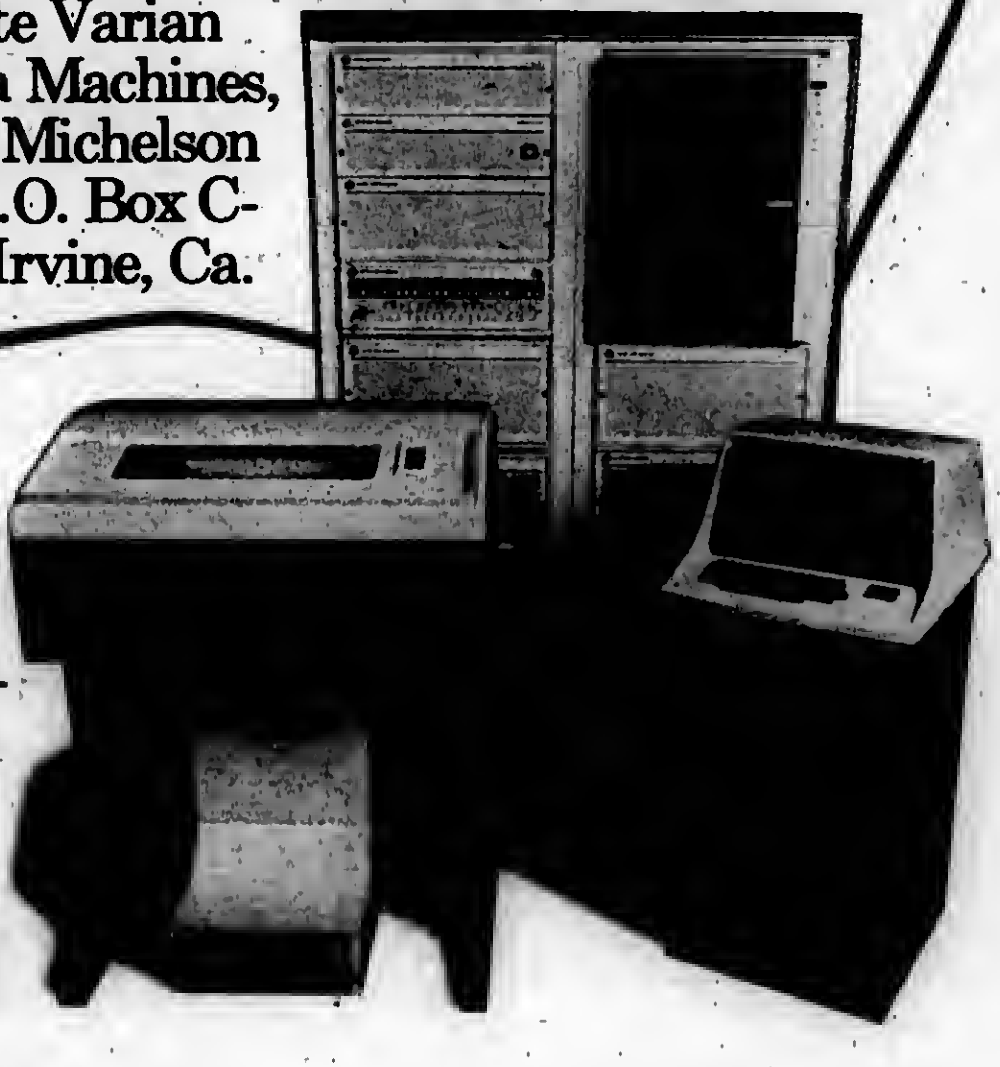

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On-Line System Allows Firm to Ship Parts Same Day

HOUSTON – A computerized order entry/inventory system enables same-day shipment of 125,000 parts from 12 locations around the country at Sterling Electronic's Industrial Division.

The automated system features Sanders Associates, Inc. CRT terminals that permit salesmen and buyers in Sterling's office here to handle up to 6,000 transactions per day. The division services more than 1,400 OEMs and maintenance repair organizations in the industrial electronic components market.

At present 14 Sanders 8171 terminals and two 88 char./sec printers are on-line to Sterling's central computer emulating IBM 3270 terminals. The Sanders control units with device adapters handle the communications between the terminals and the IBM mainframe as well as provide memory refresh.

They communicate at 4,800 bit/sec through data channel controllers via a Bell local loop to the Data Transmission Co. (Datran) microwave network to the CPU, an IBM 360/40 using eight 2314 disk drives. A larger computer is planned for the system and will use either 16 2314 drives or three 3330s.

Coding Dictionary

A coding dictionary format allows the user control over the system and files. The displayed dictionary tables can be obtained by positioning the cursor at a selection.

Each individual format includes a number of options at the bottom of the screen that permit entry of a single letter or code number to perform functions. On the sales order entry form, for example, a "C" will cancel the transaction, "R" will enter the record and select a new form to enter comments.

Telephone orders are taken by salesmen who key in the customer account number on the 8171 terminal keyboard. Within seconds, the customer name, shipping address, billing address, type of order and other pertinent data is displayed on the CRT screen.

A special feature of the Sanders terminals enables forms to be displayed in two brightness levels. There is also an underscore technique. This facilitates filling in the screen forms by highlighting those specific areas that require action.

The highlight underscore feature alerts the terminal operator to any errors during the validation phase when written orders are compared with the displayed information. Completed orders are printed out on special forms on a local printer.

The most often used format is the inventory inquiry form, Martin Stone, vice-president of Sterling, said. The computer files contain a 12-month sales-by-customer history plus a list of items unique to various locations.

Stock check can be performed at Sterling Electronics using Sanders CRT terminals.

A reserve feature enables a salesman to tie up specific merchandise while talking to the customer before the order is placed. If after 24 hours no order is received, the merchandise automatically goes back into inventory. In addition, salesmen can enter a part number and determine who has a particular item on order, he said.

Stock Check Format

"The system also includes a stock check format which shows cost of items with prices and quantity discounts with up to seven price breaks.

When all 12 locations are on-line, the system will have approximately 500,000 parts in the computer files," he added.

In all, Sterling has a total of 370 programs for some 100 basic applications. These are available to terminal operators who can call up major or minor formats and select the desired application. However, only those functions allowed by the computer for that station will be displayed.

At present the Houston office is operating on-line with the 8171 terminals and printers. The remaining 11 locations, each with two to 10 terminals and a single printer, are going on-line at the rate of one per month.

The system is designed to replace the present manual card file system. When completed, it will eliminate considerable paperwork and clerical statistical routines, Stone said.

Sterling's order entry system also provides daily reports on bookings and profits by inside and outside salesmen with month-to-date totals, and each day a listing of the total customer and branch backlog, aged by month, is provided.

Other features provided by the system include a future schedule shipment report, delinquency report for expediting orders and a detailed daily receipts report indicating whether any merchandise received yesterday is due to be shipped against current orders.

Network Aids Schools In Balancing Budgets

(Continued from Page S/18)

district expenses are maintained on this IBM system and are periodically introduced into the 5500 Datashare; this constitutes the basic information source for remote "query and answer" service afforded the remote school district.

New data on these master files may also be entered through the 3360 terminals maintained in each school district office – five at present – as well as through the three additional terminals in County Education Headquarters.

With the change to the 5500 processor, the system will be able to accommodate eight additional terminals. "We're talking with some of the 10 other school districts in the county, and we may place terminals in several of those offices also for the same kind of on-line budget monitoring, according to Bob Zanussi, management analyst for the County Schools Office.

All the people who bought our DUMB TERMINAL (the ADM-3) because of its low $995* unit price didn't really expect a lot. But they hadn't counted on the 32 switches. Switches that let you turn the DUMB TERMINAL into a pretty clever animal.

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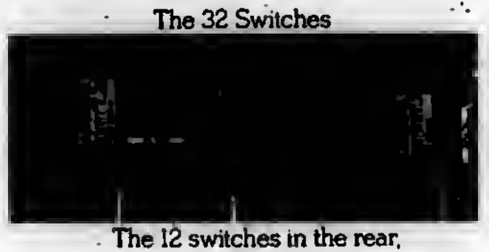
The 12 switches in the rear, on the PC board.

The 20 switches under the front name plate.

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Improves Customer Service

Telephone Terminals Speed Access to Information

QUEBEC – Salesmen at an appliance and furniture company here have been given speedier access to inventory information with a voice response system which uses telephones as I/O terminals.

Bad Boy Appliance & Furniture Co. Ltd. is a retail chain with 33 stores in the eastern provinces of Canada. Three are located in Quebec and 30 in Ontario with company headquarters in Toronto.

During 1974, there were major internal problems to be addressed within the stores, involving sales procedures and store operations using the manual order entry/inventory control system.

While customers waited, salesmen, store managers and assistants would telephone the central warehouse to determine stock availability on desired models or items of furniture. There were only four telephone lines to accommodate 200 to 300 salesmen. During peak shopping hours telephone lines between the stores and the warehouse were usually busy which prevented or delayed necessary inventory information getting to the customer.

Inventory stock status was listed on Cardex files. Since one telephone order clerk could not handle all inquiries, inventory information was split up into cardtub files by item categories which were then assigned to a specific order desk.

Centralized warehousing, while it affects lower operating expenses, also influenced the sales results. Bad Boy wanted to maintain this method vs. decentralized stocking despite the apparent competitive disadvantages.

Faced with these multifaceted problems and no apparent viable solution, Allen Lastman, Bad Boy's executive vice-president, called in an outside management consulting firm, Laventhol and Horwath, to evaluate available systems techniques.

The consulting team and Bad Boy's management ruled out alternative systems including a facsimile transmission, CRT terminals and similar I/O terminal concepts. All were considered inadequate, too complicated or costly. They entailed considerable operator time, complicated training and excessive demand on the part of Bad Boy personnel, the company said.

It was decided computer-generated voice response systems using Touch-Tone telephones as input/output terminals presented the best solution. Touch-Tone phones were installed at all the stores requiring minimal training to operate and representing significant economies in comparison with the more expensive programmable alphanumeric or special-purpose terminals, the company said.

In late 1974 existing voice response systems were researched from the standpoint of economics, flexibility and reliability. A desired feature was conversational voice output capability to ensure rapid user acceptance.

The Periphonics Voicepac 2000 driven by a Digital Equipment Corp. unit was selected as the system satisfying the requirements. By March 1975, the Voicepac 2000 was interfaced to a DEC PDP-11/35.

Using the telephone at his desk or on the sales counter, the salesman dials the Voicepac 2000. For security he identifies himself by special code and enters the store number. The Voicepac 2000 then asks him to enter the product number via the Touch-Tone pad which is also coded to provide the other information required to check current inventory status.

Computer-generated voice response validates each input to eliminate potential order entry errors. The system then informs the salesman that the item is "stocked," "not stocked" or is "special" to be ordered from the manufacturer. Delivery information is also provided in the response message for out-of-stock items having outstanding purchase orders.

The information entered by the salesman automatically initiates the appropriate action to complete the sale and adjust inventory records. The PDP-11/35 also generates reports of transactions for salesmen in every store on a daily basis. This enables management to control inventory, purchasing, sales and shipping.

Different types of voice messages which include additional instructions are provided to assist new employees in overcoming initial unfamiliarity with the system. When not handling management inquiries, inventory control and order entry, the system performs accounting and other administrative functions.

Voicepac 2000 is a buffered communications system which accepts a multiple on-line inquiries with a standard Touch-Tone telephone functioning as a remote I/O device. The training requirements are minimal. Systems reliability is high and overall costs are below alternative approaches, the company said.

Under program control, the Voicepac 2000 transfers on-line requests to the PDP-11/35. In the stand-alone configuration, input data is transferred to the system's integrated data files which includes both tape and disk storage devices.

Input inquiries are transmitted over standard dial-up communication facilities. Once an inquiry is processed, an encoded message is returned to the Voicepac 2000 which interprets the message, assembles the appropriate message sequence from its stored vocabulary and transmits a human, phrase-oriented response to the individual at the Touch-Tone terminal generated the original request. All data processing is accomplished in microseconds as compared with the earlier time-consuming, labor-intensive manual approach.

The response system is "human-engineered" with a user specified time-out factor. If a salesman does not key in each inquiry within a reasonable preset time period, he is disconnected and must reestablish his call. This procedure prevents contention on the system especially during peak periods of operation.

"Since the Periphonics audio system was installed, we have experienced negligible downtime 'conditions," Lastman said. "The acceptance by the sales force and resulting improvement in bottom-line figures has clearly proven that audio response is a most viable solution to sales order entry and inventory control problems," he added.

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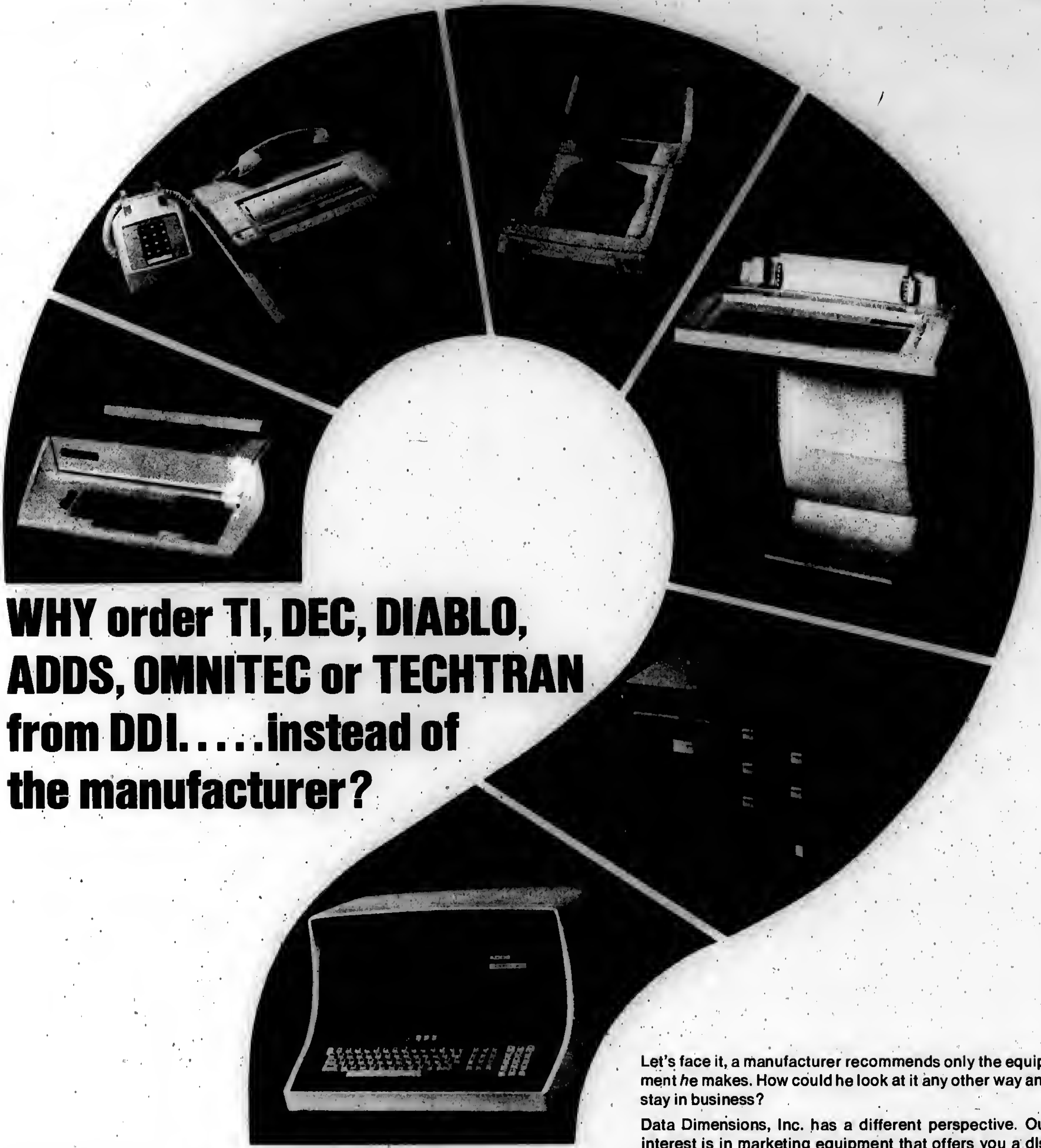

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Terminals Ensure Accuracy Of Distribution Center Orders

TORONTO – Rothmens of Pall Mall Cenade Ltd. has seven distribution centers in Canada which are responsible for shipping nearly 100 million cigarettes per day (not counting other tobacco products) to its more than 1,000 customers (wholesalers, large department stores and supermarket chains) throughout the country.

Each center is responsible for maintaining its own master file of approximately 300 customers to which it distributes nearly 100 product lines.

To ensure the accuracy of its customer order, Rothmans installed a network of Sycor, Inc. Model 340 terminals with flexible disk options to replace its TWX punched paper tape equipment.

Under the old system, operators would work with TWX machines and prepunched paper tape which contains the individual distribution center's entire customer and product files, according to William Mazanik, management information systems manager for Rothmans.

As each new order was entered, the operator would select the appropriate customer and product tapes from a nearby pegboard and key in the applicable product quantity. At the end of the day, the tape was spooled to a 4210 mini tape drive and transmitted to Toronto for processing.

Because a center receives anywherc from 30 to 300 new orders a day, the order entry process was a continual game of reaching for and replacing customer and product tapes. The result was an error rate which reflected a myriad of problems: incorrect quantities, out-of-balance quantities and garbled transmission.

"The real problem was we wanted to ship our products the same day we invoiced them," Mazarik said. "Most of the time, when the problem was found in the Toronto billing office, people in the branch office locations had already gone home. So we either had to wait until the next day or interpret the data by ourselves."

The other problem, inherent in the machines, was there were no error detection or edit/check routines to verify the data as it was being entered. This situation was quickly remedied with the creation of the new network.

Now in Vancouver, Calgary, Winnipeg, Toronto, Montreal, Quebec City and Halifax, operators enter customer orders into the terminal, capturing the day's transactions on flexible disk (capable of storing some 200,000 characters). The other diskette contains a complete customer master file, product file and bill-of-lading information.

The operator is guided through six screen formats – 13 user-written applications programs prompting the operator to complete a character or field or to tab skip through a field. Even as the person is entering the data, it is being checked and edited for out-of-range conditions and check digit verification.

It takes less than one second for the pertinent data – a customer's name and billing address, for instance – to flash on the CRT after the last of the five-digit codes is entered.

Orders are also batch balanced to compare with the order taker's figures: if the orders are not correctly in balance, each record can be reviewed for accuracy.

After the records have been entered, verified and balanced, a six-part bill of lading is produced on the attached 80 char./sec Sycor printer for inclusion in the shipping package.

The data, including inventory movement such as transfers and returns (balanced against a physically counted inventory each day) is then transmitted to Datacrown's shared-processing facility in Toronto for final processing on an IBM 370/168.

By the next morning, invoices are produced at headquarters for mailing to customers and daily sales statistics distributed to management personnel.

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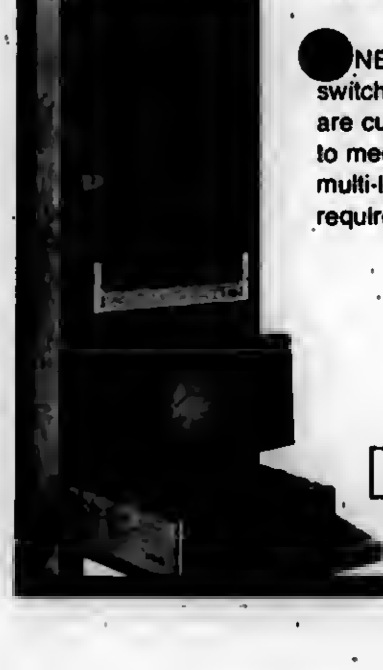

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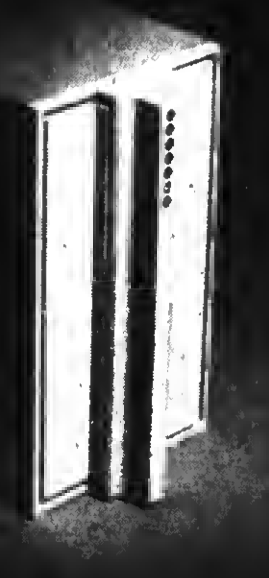

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Net Monitors Construction Firm's Schedules, Costs

HOUSTON – "Continuous usage" best sums up the operation of the worldwide data communications terminal network designed by Brown & Root, Inc.

The company, which builds offshore oil platforms, nuclear power plants, refineries, petrochemical plants and other large-scale projects all over the world, is a highly centralized organization.

Its engineering and technical skills are concentrated at corporate headquarters in Houston. It is in a business where control of schedules and costs must be maintained no matter where the actual construction takes place.

"At any time, we have as many as 50 multimillion-dollar projects in progress around the globe. We have a tremendous need to communicate. We must know where the dollars are and what problems exist," according to J. David Craig, vice-president of data processing.

To fill this need, Brown & Root has built a worldwide communications network featuring intelligent Data 100 Corp. terminals, including a growing number of Keybatch multistation clustered data entry systems.

The network keeps the firm's central DP center at Houston at full operator status virtually around the clock. The center is equipped with three IBM 370 CPUs.

During normal working hours in Houston, domestic needs are serviced and foreign communication facilities are utilized for voice transmission. In the late evening, the domestic processing load tapers off. Then, as their work day begins, installations overseas begin signing on for data.

"We get maximum utilization from both our communication facilities and DP systems," Craig said. "We run a three-shift, seven-day operation, and we provide timely answers."

Variety of Applications

Brown & Root uses these terminals in a variety of general business applications. "But we do have a few exotic ones, too," Craig said.

For example, through an in-house-developed program called Design and Analysis of Marine Structures (Dams), Data 100 systems help determine things such as the weight, horizontal and vertical wave loads and stress relationships that can be tolerated by marine structures.

Engineers, who are designing offshore drilling and production platforms, enter data relating to the environment.

The data is processed at the Houston center and detailed calculations are returned, providing a complete analysis of the design and specifications for materials to be included in construction.

Another important application run from Data 100 terminals is payroll checks and labor costs which feed into Brown & Root's unit cost and scheduling systems and provide the company and its clients with a quick and efficient means of determining whether the project will be "on time and within budget."

Brown & Root's relationship with Data 100 began when a single Model 70 hard-wired batch terminal was installed at Houston in the fall of 1971.

Since then, the relationship has grown substantially. "We got good delivery. The equipment worked and, most important, Data 100 gave us responsive service," he said. Today Brown & Root has 45 Data 100 systems worldwide with more scheduled to be delivered by year end.

Overseas Network

As part of the overseas network, three large Model 78 systems processors communicate with Houston via satellite from Singapore, Bahrain on the Arabian Gulf and Teheran, Iran.

Small four-station Keybatch Systems in Scotland and Great Yarmouth, England, communicate with a Keybatch System in London.

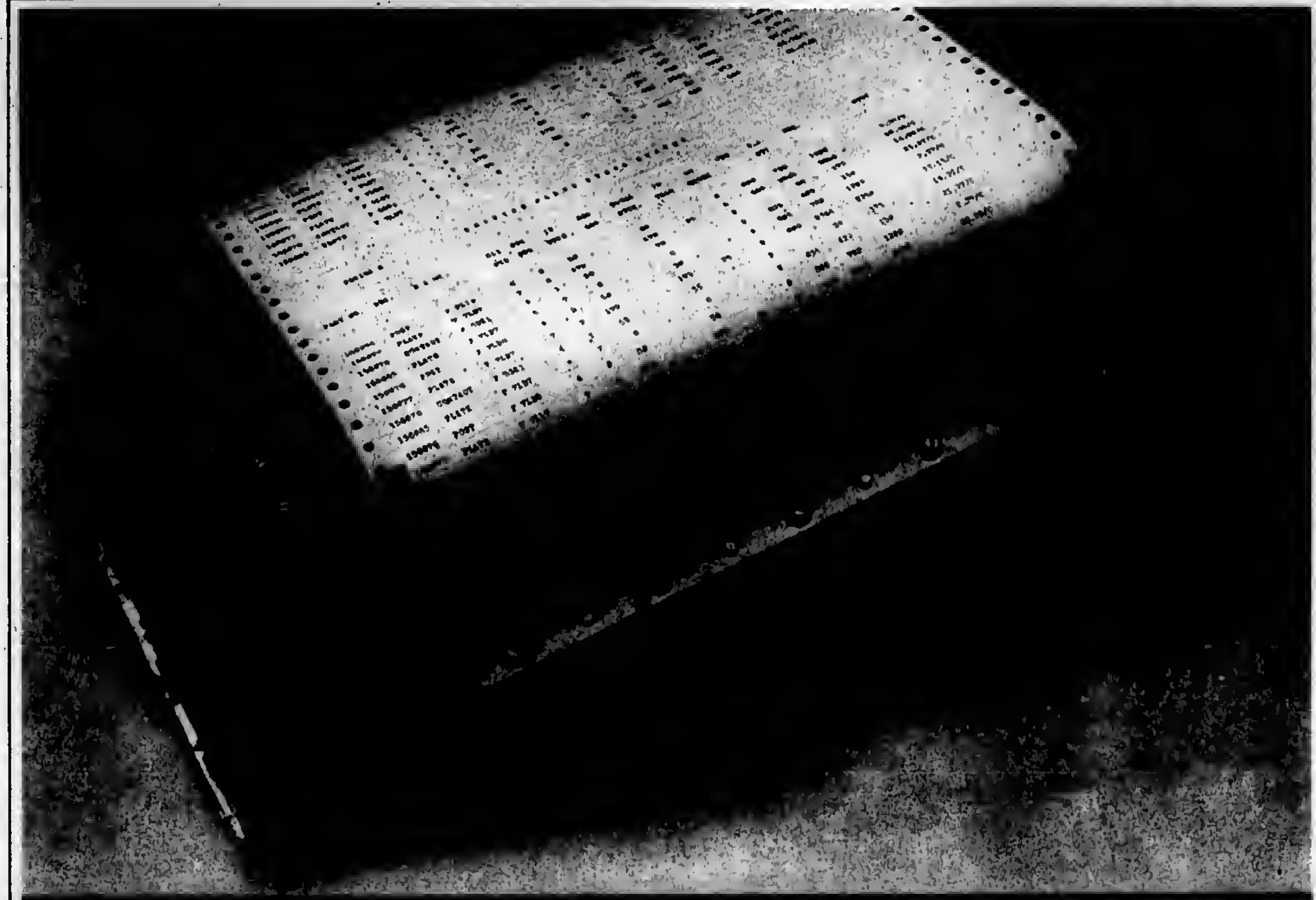
And a similar system in Paris communicates either with London or directly with Houston via private lines. London, which communicates directly with Houston also, has both a Keybatch system and a large Model 78 with a 1,250 line/min printer.

The domestic side of the network includes 38 Data 100 terminal systems, mostly Model 78 systems processors, installed in places like Anchorage, Alaska, and at large nuclear power sites that Brown & Root is building at such locations as Glenrose, Texas; Bayport, Texas; and Southport, N.C.

Larger sites, whose DP requirements are more or less continuous, communicate directly on leased lines or dial networks with the central computers at Houston.

However, in the interest of economizing on the use of mainframe computer time, smaller sites, such as the installations at Redfield, Ark.; Granger, Wyo.; and Bagdad, Ariz., communicate via dial-up phone lines with a Data 100 Model 78 terminal system installed in Houston.

There the information is spooled on magnetic tape before transfer to the mainframes for final processing. The results are then transmitted back to the locations for printing.



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T/S Keeps Records Without Taxing Druggist's Time

OMAHA, Neb. – A druggist here has found a pharmaceutical/patient computer time-sharing service is just what the doctor ordered to free him from recordkeeping while keeping information on his patients.

A General Electric Terminet 300 split-platen receive-only printer and an Incoterm SPD 10/20 CRT in the drug store allows Mike Feldman, owner of Feld Drug, to access HDR Systems, Inc.'s Control Data Corp. 6400 computer.

The Automated Information for Druggists (AID) system is "a basic solution to the ever-increasing problem of clerical work which can occupy a great deal of the pharmacist's time," Feldman said.

The four hour/day now being saved and full reimbursement from third-party agencies such as Blue Cross, Blue Shield and so on is enough to pay for the system, he said.

Labels and receipts may be printed out immediately if the pharmacist wishes, or he may batch prescription entries and call for labels and receipts later, thus making better use of terminal on-line time and facilitating group receipts for nursing home patients.

Ability of the printer to print out labels and receipts simultaneously is one of the advantages Feldman cited.

The fact that the two platens operate independently has meant another substantial cost reduction to Feld Drug. "Only one receipt is printed for each customer," Feldman said, "no matter how many prescriptions are filled.

"Our store is open 12 hours a day, seven days a week; we've only needed service on the teleprinter once in four months."

Besides enabling the pharmacist to do his work more accurately and completely, AID provides services to the user drug stores without automation aren't able to offer, Feldman said. For instance, AID will produce a profile of all prescriptions and refills for a given patient.

Checks are made by AID for refilling of scheduled drugs, exceeding the refill limit and refilling before the day's supply is used up. Thus, a time warning is given if a 30-day supply of a drug is refilled in, say, 10 days.

Also, the ability to test for drug interactions is in the planning stages. Pharmacists will be able to check a given drug against all others in a patient's profile for harmful side effects from generic-to-generic, generic-to-class or drug-to-therapeutic condition relationshps.

The AID user may refer to a certain drug by simply indexing the National Drug Code number. Since this is usually printed on all containers and packages, the pharmacist can index the correct drug without looking up other reference numbers.

Summary financial information can benefit both the pharmacist and the patient. Upon request a daily log may be printed showing numbers of prescriptions, sales and cost figures and a breakdown by third-party fiscal agent, single patient or nursing home.

Inquiry can be made into a patient's total year's expenditures for his personal income tax reporting. Also, those prescriptions for which payment has not been made can be readily identified.

Inventory control, typically done "by the seat of the pants" according to Feldman, can now be maintained exactly through use of AID's drug utilization reports. "By using the drug reports, we can keep absolute control over inventory and not rely on whim," he said.

Portable Units Give Baker Larger Piece Of the Profit Pie

WORCESTER, Mass. – The ability to develop sales statistics in 24 hours is helping Table Talk Pies, Inc. improve profits because what the bakery bakes today is dependent on what was sold yesterday.

By using MSI Data Corp. portable data entry terminals to record and input daily pie orders, Table Talk's order entry cycle has been improved. The MSI system enables Table Talk's central computer to process each day's order data on a set schedule, thereby allowing accurate sales statistics which are used to forecast bakery requirements.

"The savings of reduced telephone costs, labor, errors and keypunch card stock will replay the original investment on the equipment within 36 months," Larry Cassella, the company's DP manager, said.

Prior to employing MSI's Source 2100 terminals, "Consolidating, keypunching and processing 290 orders each day, day after day, was leading to unacceptable lead times. Our routemen simply could not forecast that far ahead with any acceptable degree of accuracy," Cassella said.

At Table Talk's nine distribution centers, data for the more than 150,000 pies and pastries the company bakes each evening is recorded on an MSI terminal (which stores the recorded data on magnetic tape) as the routemen bring in the information.

Once all the data is recorded, the information is transmitted to Table Talk's DP center via dial-up telephone lines. At the center an MSI 2720 receiver rerecords and verifies the data automatically and stores it on magnetic tape for direct computer entry.

Prior to employing the MSI system, Table Talk input orders via an on-line IBM 1001 remote keypunching system. The IBM system was an improvement over pencil-and-paper techniques, but had its drawbacks. "We found we were completely tying up five Wats lines between 8:30 a.m. and 3:30 p.m. on the IBM method," Cassella said.

The move to MSI equipment has drastically reduced telephone expenses. "Our Brooklyn order, which used to take three hours to get in, is now transmitted in less than five minutes," Cassella said. "We've been able to eliminate two of the Wats lines and limit our time on the other three to within the allowable hours."

Table Talk's entire order entry cycle has been streamlined because the MSI terminals are capable of recording and storing a complete day's worth of order information and transmitting that data at the convenience of the company in a very short period of time, Cassella said.

Order accuracy, work flow and manpower utilization have been improved considerably. Error checking is now done at the source.

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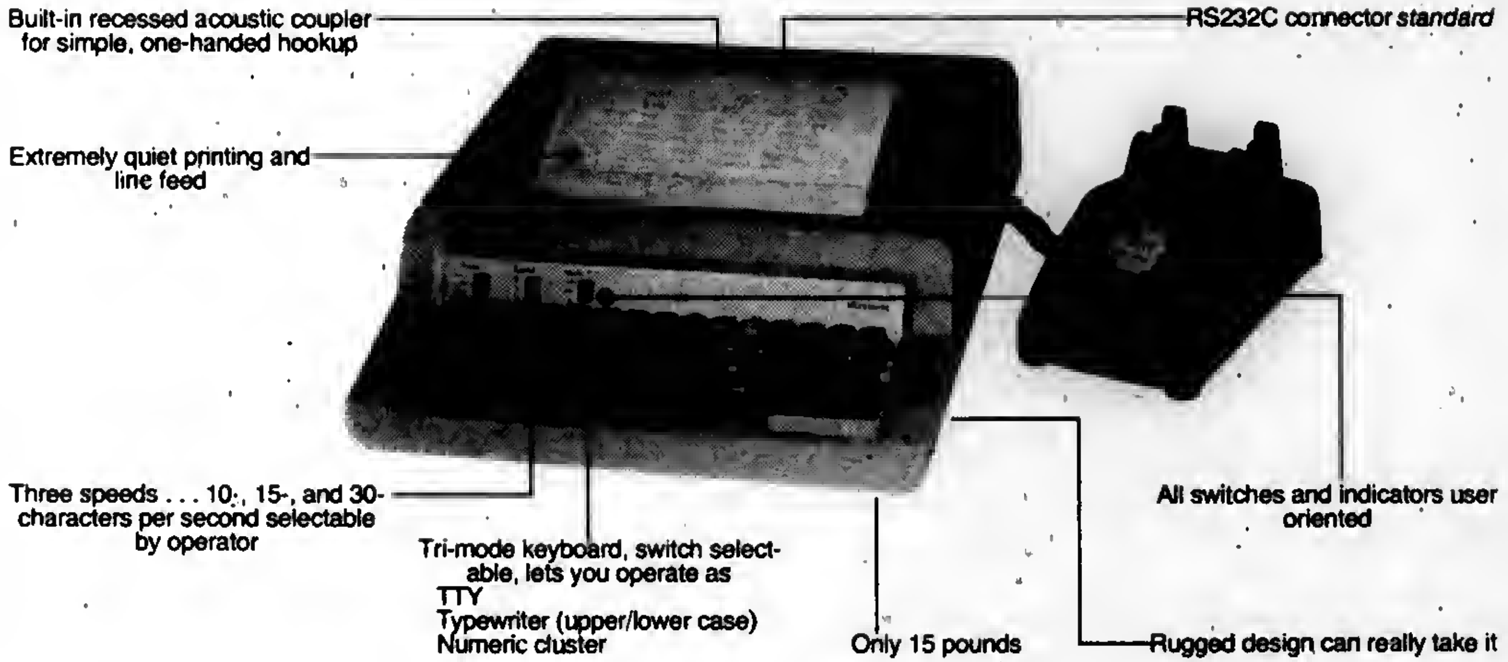
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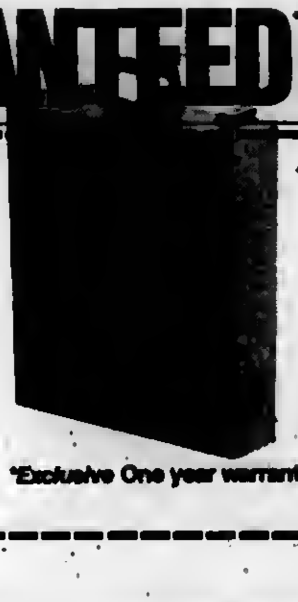

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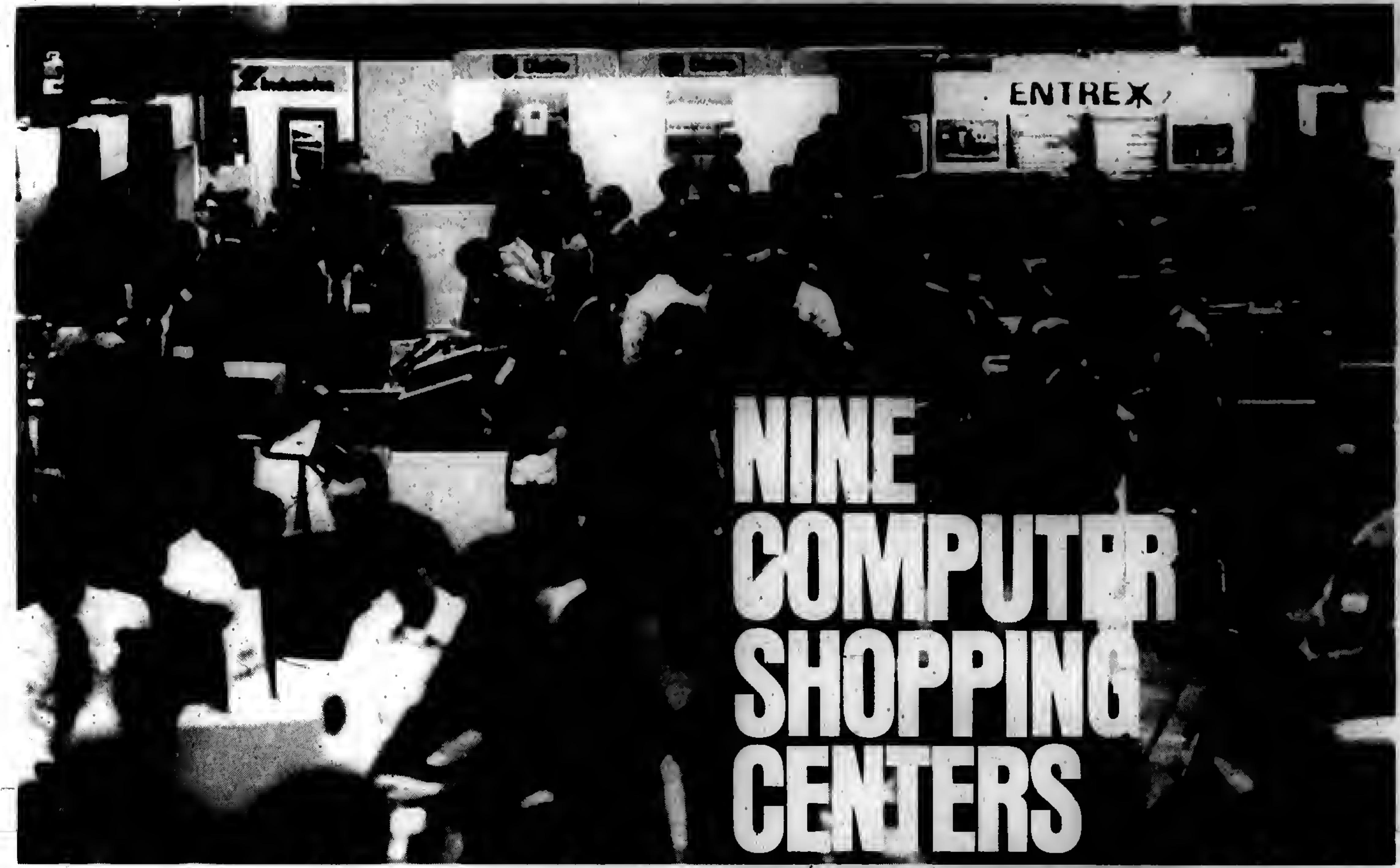

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CI Notes

Singer to Sell Cogar Corp., System Ten Rights to ICL

NEW YORK – Singer Co. has agreed in principle to sell Cogar Corp., its subsidiary, and the manufacturing and marketing rights to its System Ten and point-of-sale systems to International Computers Ltd. (ICL).

The British firm already provides support to the international base of Singer users while TRW, Inc. provides maintenance to U.S. users.

ICL has assumed management control of both Cogar and the other product activities; total incorporation of the two areas into ICL is expected by year-end.

The agreement provides for the transfer of the main Cogar facility in Utica, N.Y., to ICL at the end of the year, a Singer spokesman said.

The TRW-Singer agreement gave TRW first option on assuming ownership of the Singer installed base, exercisable on or about Oct. 1.

Eli Hiller, acting president of International Computers (U.S.) Ltd., indicated previously the firm, which currently markets in the New York metropolitan area, intends to expand in the U.S. but that it was premature to say whether this would be through internal growth or acquisition.

Univac Dedicates Car Group

DETROIT – Univac has established a dedicated marketing unit for the automotive industry to "markedly increase our ability to respond to the changing needs of this important market," according to Charles E. Grundman, central operations vice-president.

The firm has similar dedicated branches in Houston for energy; Philadelphia, manufacturing; and Los Angeles, public sector, as well as others assigned to individual agencies of the U.S. government.

Commerce Opens DP Division

WASHINGTON, D.C. – The U.S. Department of Commerce's Office of International Marketing has established the Operations Planning Division to provide specific industries with better channels of communication regarding the planning of Commerce-sponsored International trade events and the purchasing of market research overseas.

Business equipment and computers and related auxiliary equipment are under the direction of George L. Zanetakos in Group I, while Group II, headed by Eugene F. Shaw Jr., includes production and test machinery and equipment for the electronics industry.

AMS, Intersil Set Merger

SUNNYVALE, Calif. – Two semiconductor firms, Advanced Memory Systems, Inc. (AMS) and Intersil, Inc., have agreed in principle to a merger.

The agreement calls for an exchange of .95 shares of AMS common for each outstanding share of Intersil common.

The new firm will be called Intersil, Inc. with Orion L. Hoch as president and chief executive officer. Hoch is president of AMS.

Supershorts

TRW Datacom International has appointed Cherma as its distributor in Greece for DP equipment of U.S. manufacturers for which TRW Datacom has international marketing rights.

– – . –

A.O. Smith Corp.'s Data Systems Division is marketing the Mesa/Two small business system from Martin, Wolfe of San Diego in five Midwestern states.

Low-Cost Minis Cited as Factor

Data Units to Crest $1 Billion in '80

By Toni Wiseman
Of the CW Staff

SAN JOSE, Calif. – The communications processor market will grow at a compound annual rate of 19% – from $429 million in 1975 to $1.01 billion by 1980, according to a recent report from Creative Strategies, Inc. (CSI).

Front-end processors, the largest portion of the communictions processor market, were seen growing from $240 million in 1975 to $653 million in 1980 by the market research and consulting firm.

The market for switching systems will increase from $162.5 million to $259.5 million during the same period, the company added.

Sales of programmable remote concentrators will rise from $26.5 million to $104 million in the five-year period, the report projected, noting that currently only about 3% of all multiplexers and concentrators are programmable. It predicted that figure would grow to about 10% by 1980.

"The demand for communications processors is on the upswing due to the rapid increase in data communications networks and the rapid decrease in the cost of minicomputers," the report said.

"The more central processors are used in data transmission networks, the more desirable it is to have communications processors take over menial tasks and free the CPU for complex computational functions," it stated.

CSI cited two main factors affecting the growth of the market: the relative price/performance of communications processors and the growth of the market for general-purpose CPUs or the percentage of these CPUs supporting communications.

In terms of price/performance, the report cited the effect the economics of integrated circuitry has had on DP functions. The price of a 4K minicomputer, for instance, dropped from close to $18,000 in 1965 to less than $2,000 in 1975.

As a result, the cost of many data communications functions has declined significantly without any performance erosion, CSI said.

With the advent of microprocessors, the firm predicted, the price/performance trend will continue and, as a result, there will be more programmable communications processors and fewer hard-wired processors.

With the proliferation of the distributed processing concept, "the intelligent terminal market begins to become a competitor to stand-alone communications processors," the report stated, since it is possible to incorporate many of the front-end processing, message-switching and line concentration functions into the terminal itself.

"Furthermore, the introduction of distributed data processing usually results in a reduced need for communications and therefore a reduced need for communications processors," CSI observed.

Surveying the market, the report predicted a rise in the number of installed general-purpose CPUs from 69,000 at year-end 1975 to 97,000 at year-end 1980.

The percentage of CPUs hosting data communications networks will increase from about 30% to about 45% during the same period, while the number of front ends per host CPU will remain fairly constant, at a ratio of 1:2, CSI said.

The ratio of multiplexers and concentrators per host CPU will increase slightly from 1:9 to 2:0 during the five-year period, the report added.

Competition in the communications processor market comes from mainframe manufacturers, general-purpose minicomputer suppliers, dedicated minicomputer suppliers and systems houses, the study noted.

Competitors in the mainframe area such as Burroughs, Control Data Corp., Honeywell and IBM "are generally more interested in supplying the host computer to a network rather than the network communications processors," CSI said.

However, with the spread of communications networks, they are finding themselves forced into the business or faced with losing it.

General-purpose mini suppliers – Computer Automation, Data General and Interdata, for instance – welcome the market as an ideal outlet for their products as the demand shifts away from hard-wired to programmable processors, according to the report.

Collins, Comten and Computer Communications, on the other hand, supply minicomputers dedicated to their particular communications processor system.

In addition to competition from each other, these suppliers face competition from microprocessors, CSI stated, noting that as many as 15% of the communications processor applications installed in 1975 used a microprocessor rather than a minicomputer.

State Tax Laws Related to DP Compiled in Survey by Adapso

By Molly Upton
Of the CW Staff

MONTVALE, N.J. – A compendium of state regulations of sales, property and use tax laws as they relate to computer software, data processing and related transactions has been published by the Association of Data Processing Service Organizations, Inc. (Adapso).

The survey, prepared by Richard D. Gould, Adapso's tax consultant, was designed to summarize the impact of these various laws on the computer industry at the present time.

For example, operating software is classified along with hardware as personal property in California, but most other states have not considered the question, the report noted.

The status of application software is somewhat more vague. "The question of whether software will be considered tangible personal property is particularly problematical in this area of taxation because local practice may differ as to its treatment," Adapso said.

The principal question regarding sales tax hinges on whether applications software is declared personal property, it added.

The use tax, found in those states having a sales tax, is levied on tangible personal property "used, stored or consumed" in the state when the sales tax imposed by that state has not been paid, Adapso said. This situation normally occurs when tangible personal property is purchased or leased from outside the taxing state for use within it, the organization explained.

California applies personal property taxes to systems software which may be assessed and taxed at "full cash value," the report said.

However, for other programs, a specific exception is provided for " 'storage media for computer programs' which are to be valued 'as if there were no computer programs on such media.' "

Regarding sales taxes, California taxes the sale or lease of either packaged or custom software. Transferred "in the form of punched cards or in tape, disk, drum or similar form."

There is no tax on transfers in the form of " 'written procedures, such as program instructions listed on coding sheets.' " This feature distinguishes the tax treatment of custom software from package software, the report observed.

When information is submitted to a service bureau in human-readable form, the data processing is construed as a service and thus nontaxable, while that for information in machine-readable property, according to the report.

The cost of additional copies of reports is subject to sales tax.

In California, charges for keypunching and similar tasks are "considered taxable where the service bureau's agreement provides solely for such services." Charges for remote time-sharing are not subject to tax.

In Massachusetts, in contrast, there are practices regarding inclusion or exclusion of DP-related goods and services to taxa-

(Continued on Page 28)

Cbema Takes Anti-Bell Bill Stand

WASHINGTON, D.C. – The Computer and Business Equipment Manufacturers Association (Cbema) opposed passage of the Consumer Communications Reform Act of 1976 in an open letter to congressmen.

Cbema President Peter F. McCloskey stated the act, also known as the Bell Bill, would do away with established national policy and weaken the Federal Communications Commission's authority to promote and implement its congressional mandate to maintain an effective and efficient national telecommunications system.

"Continuation of the present national telecommunications policy is of vital importance," McCloskey said. "We must continue to have a uniform national policy which will permit the least costly manufacture, distribution, installation and use of consumer-utilized equipment in all of the states.

"The [Bell Bills are] specifically designed to frustrate the continuation of such policy.

"The bills will increase consumer costs by subjecting the users as well as the manufacturers to a wide variety of conflicting and diffuse state regulator standards and requirements imposed by each state's public utility commission.

"In some states," he said, "competition would be eliminated entirely, thus eliminating freedom of choice for users."

While the promotion of the legislation has included references to the serious adverse effect the continued enforcement of the current national policy favoring competition would have on established common carriers' revenues and local residential rates, the public record offers "compelling" evidence to refute these representations, he said.

The public record shows that exactly the opposite would occur, he told the legislators.

In Sales to End Users, OEMs

Microdata Hits 50-50 Distribution Goal

By Esther Surden
Of the CW Staff

NEW YORK – Microdata Corp. has finally reached a 50-50 distribution between OEM and end-user business, according to Donald W. Fuller, chairman and president.

"We have come to the point where we have achieved the mix we wanted," Fuller said here recently.

The firm outlined a five-year plan aiming at this distribution in 1971, Fuller said. Among the goals were concentration on the data base management system market in offices and factories, vertical integration to take advantage of manufacturing economies and avoidance of the rental and IBM-compatible marketplaces.

With 500 Reality systems installed, Microdata now wants to be known as a minicomputer periheral company as well. The firm recently introduced the Winchester technology fixed-media Reflex disk and the Lodestar cartridge tape drive.

Most mainframers offer peripherals begrudgingly, according to Bud Bleiningers Microdata vice-president of peripherals, but this is not the case with Microdata.

Entering the peripherals marketplace generates substantial volume for a firm, expands the company's financial base and extends the geographical coverage for sales, he said.

Peripherals Provide Profits

"We expect that two-thirds of our expected revenues will be in peripherals," Bleininger said. "Those who think of Microdata as a mainframe manufacturer who incidentally offers peripherals will have to change their minds."

The independent supplier, Bleininger said, is a victim of its own success. The independent supplier stays in business offering marginal products to marginal companies, he said, but as minicomputer companies realize the benefits, they begin to make their own peripherals.

The Reflex disk drive does not have media removability, a feature many industry observers feel is important. However, Phil Cleveland, vice-president of marketing, said a survey of more than 450 users totaling 60% of the disk-buying market found few users actually required it.

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Wescon Set for Sept. 14-17

LOS ANGELES – The Wescon/76 conference will feature 35 half-day sessions along with an exhibition which will be held here Sept. 14-17.

Session titles include "Microcomputer Applications," "Microprocessor Design Aids – The μP Manufacturer's Viewpoint," "Near-Term Satellite Communications Systems" and "Microcomputer/Microprocessor Standardization Schemes in Industry and Government."

Optical fiber communication, the application of charge transfer devices to sampled-data signal processing and future LSI technologies will also be discussed.

Some 25 computer and peripheral manufacturers will be among the 400 companies exhibiting at the show. Data General Corp., Digital Equipment Corp., Hewlett-Packard Co., Intel Corp., the Potter Co. and Tektronix will be among those showing their wares.

Further information on Wescon/76 is available from the show office at 999 Sepulveda Blvd., El Segundo, Calif. 90245.

Software International Eyes Big Growth

By a CW Staff Writer

ANDOVER, Mass. – Software International, Inc.'s 1976 revenues should reach about $5.2 million, well over 60% above the results for 1975, according to Chairman Bill Watson.

This is a continuation of the trend existing for the last five years, he added. Software International is now the second largest producer of applications software, he said.

The firm has sold about $1.2 million worth of its manufacturing package, he said, which was announced last year and has been handled by one salesman.

Software International didn't begin advertising the product until recently because it didn't want to be in the position of having more business than it could handle, he explained.

Watson is "absolutely elated" about the progress of the package, which he said took almost five years to construct and cost over $1 million. The firm has 25 of its 110 employees working in this area.

The package includes bill of material, net change, material requirements planning, master scheduling, purchasing, shop floor control and inventory.

Watson described the package as an integrated manufacturing system with over 700 modules integrated under the control of a monitor that can run on a machine as small as a 64K IBM 360.

In another two years, Watson said, the manufacturing system will probably surpass the firm's financial systems in revenues. Several mainframe manufacturers have expressed interest in the package, he added.

The firm's products in the IBM 3 area – general ledger, accounts payable and accounts receivable – have "really started to boom," Watson said.

Users have become more sophisticated, and the large users that have the firm's other products have installed these on their 3s while the smaller users have found the 3s to be more powerful than they thought, he said.

Watson said he is planning to implement the manufacturing system in the IBM 3.

An increasing portion of the firm's sales are being installed without modification, he observed. A year ago 75% of its packages went in without modification, 20% received minor changes and 5% major changes.

Now 90% are installed with no modifications and 10% with minor changes, he said.

The firm has been enhancing its packages to eliminate the need for modifications, he said.

Currently Software International counts among its customers 125 of the Fortune 500 companies and has packages installed in 19 countries, he said.

International sales have been going well; Watson expects these revenues to be between $1.3 million and $1.4 million for the year, growing to $2 million in 1977.

The firm has agents in the UK, South Africa, West Germany, the Far East, Near East, Australia and New Zealand, Norway and South America.

The growth in the packaged software industry is a result of the industry coming of age, he said.

If a DP manager is doing his job, he has to evaluate what is available in the marketplace, Watson said, adding there's a lot of good software.

Packaged software is 10 times cheaper and can be implemented 40 times faster; it is satisfies 90% of a user's needs, that's as much as one can expect, he said.

Adapso Compiles State Tax Laws

(Continued from Page 27)

tion, most of which were termed "not legally binding" by the survey.

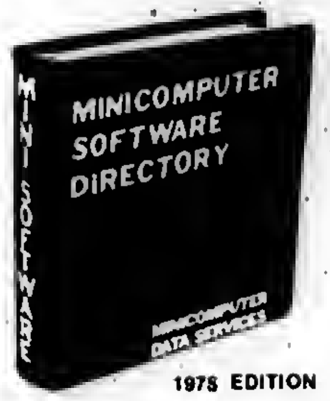
For instance, the sale or leasing of either packaged or custom software is customarily subject to sales tax.

On the other hand, DP services are considered not subject to sales taxes since they have been interpreted as "the furnishing of information which is personal or individual in nature and which is not or may not be substantially incorporated in reports furnished to other persons," an exclusionary phrase.

Currently the charges for remote time-sharing or for keypunching services are not generally subject to sales taxes.

However, as with all the other instances cited in Massachusetts, the Adapso report noted these practices are not "embodied in any formal rule or regulation and are not legally binding."

The summary costs $92.50 from Adapso at 210 Summit Ave., Montvale, N.J. 07645.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International News

With 2,183 Systems Installed

Swiss Mart Seen Near Saturation Point

By Toni Wiseman
Of the CW Staff

FRIBOURG, Switzerland – The total number of computers installed in Switzerland at mid-1975 was 2,183, which seems to indicate a near saturation of the market, according to a study by the University of Fribourg.

The highest density of computers was in the cantons of Bale-Ville and Geneva, details of the study in *EDP Europa Report* (EDP/ER) showed.

Almost half (47%) of all installed machines, representing 58% of the installed value, were manufactured by IBM, the report said.

Market Shares

Market shares have remained fairly constant since 1969 with the exceptions of Univac and NCR. Univac claimed 20% of the market in 1969 but only 9% in 1975 while NCR's share rose from 5% in 1969 to 15.6% in 1975, according to EDP/ER.

In terms of market value, Univac's 15% followed IBM's 58.2% and Honeywell-Bull was third with 7.7%. NCR and Control Data Corp. each claimed 6% in mid-1975.

The highest number of installations was in the banking sector and metallurgic industry, which showed an average of 1.27 machines per installation, according to the university's report. Together the two industries accounted for 758 of the total 2,183 installed systems.

Commerce, administration and education followed closely, with commerce having 315 computers while administration and education had 244.

In addition, there were some 2,080 small business systems installed in Switzerland in mid-1975.

Absorption Seen at 2,600

The study was based on 18,364 firms, of which 1,374 were known to have computers or small business systems installed. Of the remainder, the university research team took a random 10% sample, thereby basing their findings on 3,073 firms.

The Swiss market could not absorb more than 2,600 computers, the research team determined. Nevertheless, it feels there is a considerable move toward small and medium-scale computers.

The number of very small systems, with up to 16K bytes of core, is diminishing and the number of large systems remains constant, it noted.

Terminals Double

While there has only been a 2% growth in the number of installed computers in the last year, the number of terminals grew almost 50% from 4,690 in mid-1974 to 6,991 by mid-1975, the report stated.

The study also investigated operating methods and found 83% of the shops were using batch processing, 35% multiprogramming and 6% time-sharing.

Data communications is the main area of activity presently in Switzerland, with some 50% of the larger installations planning to extend their networks over the next year.

Networks currently in operations range from Swissair's 800 terminals and Credit Suisse's 200 terminals to operations with one to 10 terminals used for local data entry and file retrieval, the report found.

Spanish Market for DP Underrated, Study Says

Special to Computerworld

MADRID, Spain – The market in Spain for computer and peripheral equipment is much stronger and much more dynamic than it has been thought to be, according to a study by Syscom, a Spanish consulting firm.

Previous studies by both American and European researchers have grossly underestimated many important aspects of the picture, Syscom said.

In fact, a considerable potential exists for the establishment of Spanish branches of foreign firms specializing in systems analysis, program analysis, custom programming and troubleshooting of programs for the systems, the firm stated.

An example of shortsightedness in viewing the Spanish market is a 1974 "in-depth" report on data communications in Europe in which Spain was barely mentioned, Syscom noted.

The fact is that CTNE, the national telephone monopoly, began operation of the world's first commercial packet-switching network in 1971, the Syscom report said.

There are presently 1,279 terminals and computers connected to this network.

In addition, CTNE maintains 9,532 full-time leased data transmission lines and 400 installations connected to a separate message-switching network.

As these figures indicate, Spain is probably way in front of the rest of Europe in data transmission facilities, Syscom noted.

Software Growing

A far more serious oversight is the failure of market surveyors to appreciate the rapidly increasing value of the software market because the true value of software is hard to establish and easy to underestimate.

One survey made in Spain in 1973 listed software and services as only 16.6% of total national DP expenditures.

All trade sources interviewed for Syscom study agreed that the ratio of hardware to software expenditures at the present time is about 50:50 and that software expenditures are beginning to outpace those for hardware.

The total market for hardware in 1975 in Spain was $150 million; approximately the same amount was spent for software, Syscom found.

Most software services are presently supplied by the same multinational companies, almost exclusively U.S.-based, which supply the mainframes and most of the peripherals. There are very few independent software suppliers, the Syscom study found.

Burroughs Switches Rep in Israel; Disputed Contract Conditions Cited

By Alex Ragen
Special to Computerworld

JERUSALEM, Israel – The contract between Burroughs Corp. and its Israeli agent, Tamkin Ltd. was not renewed when it expired last month because of Burroughs' reluctance to accept the conditions put forth by Tamkin's parent concern, the Clal conglomerate.

Clal was insisting Burroughs transform Tamkin into a Burroughs branch office in order to lend the prestige of the American firm's name to the Israeli firm and hopefully reverse its sagging fortune, observers said.

Burroughs has appointed International Peripheral Equipment (the Israeli agent for Memorex, Itel and Systems Technology Corp.) as its distributor in place of Tamkin.

$2 Million Deficit

At the heart of the dispute was Tamkin's accumulated deficit of $2 million, which Clal sources believe to be closer to $4 million, and the fact that there is little hope for a reversal in the firm's profit picture.

In fact, in the course of an extensive reorganization last autumn, Tamkin fired all its salesmen and all but six of its programmers.

Tamkin's troubles data back to the original contract the firm signed with Burroughs which required Tamkin to pay Burroughs for hardware whether or not it was operable. It is this contract which Clal sought to modify.

Hardware Replacements

Tamkin also had difficulties with some of the hardware it sold and, when it was unable to correct them, it sometimes responded to a customer's threat to defect to another manufacturer by replacing the malfunctioning equipment with a more expensive model and absorbing most or all of the expense itself.

There are 17 Burroughs installations in Israel; in comparison, IBM has about 200.

A Burroughs spokesman said International Peripheral Equipment will provide maintenance and support for the systems Tamkin has installed.

Foreign Orders & Installations

The University of Manchester, England, has ordered T800 tape transports and D300 twin disks from Pertec Corp. for use with two Circe computers designed by the university for scientific applications.

The DP center of 17 Paris area savings banks, a group known as CTIRCEBP, has installed twin NCR Century 300 computers and approximately 200 terminals for a teleprocessing network.

The Bank of Canada in Ottawa has ordered two document processing systems from Recognition Equipment, Inc. to be used in the administrative management of Canada's public debt.

Real Supermarkets of Brazil has installed a point-of-sale system consisting of Sweda Series 500 electronic terminals and a System 80 computer.

The United Biscuits Group of the UK has ordered 12 B80 systems from Burroughs Corp. to replace electromechanical accounting machines.

Oy Wartsila, a Finnish shipbuilding firm, has ordered two Univac 1100/11 systems.

EMI Ltd. of England has ordered a Honeywell 66/20 system.

Komatsu International Manufacturing Co., Ltd. of Japan has ordered a Univac 1100/11 system from Nippon Univac Kaisha.

Hygena, a UK furniture manufacturer, has ordered a Univac 90/60 system.

Ian Allan Ltd., a British publisher, has ordered an NCR Century 8200 system for on-line order entry.

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Adapso Slates Legal Seminar

COLORADO SPRINGS, Colo. – Attorneys in the computer services industry will conduct an in-depth review of the corporate legal function during a two-day seminar sponsored by the Association of Data Processing Service Organizations (Adapso) on Sept. 17-18, here.

Discussions will include contract preparation, review and administration; compliance with regulatory and environmental issues; accounting, taxation, audit and reporting functions; and internal administration.

The seminar faculty includes general counsels from The Service Bureau Corp., Boeing Computer Services, Tymshare, Inc., Automatic Data Processing, Inc., Grumman Data Systems Corp. and Adapso.

Registration for the meeting is $225 for Adapso members, $350 for all others. Further information is available from Adapso at 210 Summit Ave., Montvale, N.J. 07645.

HP Unbundles Support As Part of Series II Plan

By Esther Surden

Of the CW Staff

NEW YORK – Hewlett-Packard Co. (HP) has unbundled its support services in a major effort to establish a "professional relationship with the customer," according to Bill Krause, General Systems Division marketing manager.

"The plan for success is to provide the customer with the assistance he needs to make his applications operate on the HP 3000 Series II as quickly as possible," Krause said.

The firm asked its customers what services they would be willing to pay for if they were unbundled and created a "menu" of support services. Included in the price of the Series II [CW, May 31] is assistance in selecting the proper model and configuring the correct Series II, he added.

The company has built and tested more than 40 of the Series II systems with deliveries beginning in the middle of this month.

Ed McCracken, general manager of the HP General Systems Division, said the "computer market can be divided into three spectrums: the general-purpose spectrum, the small business area and the minicomputer.

"They all overlap at one point and that is where the 3000 Series II fits in," he added.

The Series II will participate in all the markets, McCracken said, noting the supermini market is growing at over 50% per year.

As growth in this market continues, HP expects to see the 3000 installed base double in the next eight to nine months, he said.

This will be the result of three major trends, McCracken said. First, large companies are moving toward distributed processing because of a "new price/performance" advantage with these systems.

Secondly, the small business sector is experiencing a rapid growth rate. The Series II is aimed at the second-time computer user as an upgrade from either an already installed system or from a service bureau; it is not for the inexperienced user, he noted.

The third trend is one toward data base management applications.

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The Program

OCT. 6 — A.M.: NETWORK PROCESSORS

Popular mainframes and how they stack up for datacomm applications, with a look at how mainframe manufacturers are upgrading their machines' teleprocessing capabilities.

Datacomm software. How the trend to distributed DP and on-line data base systems is affecting data communications software offerings, and what changes users can expect with SNA-type networks.

Communications processors. Users detail their evaluation procedures for selecting communications processors for front-end and message switching applications.

Plus — a rundown on IBM's enhancements to its 3704/5 and the improvements they triggered in competitive front-end processors, as well as the state-of-the-art with the less-volatile message switchers and data concentrators. Also a review of processors and their role in centralized and distributed networks, with an update on networking techniques and protocols.

P.M.: TERMINALS

Terminal evaluation. Users give their individual formulas for appraising on-line interactive devices and data entry/processing terminal systems.

Teleprinters and glass Teletypes. A status report on the latest impact and non-impact machines and their CRT equivalents.

Microprocessors and semiconductor memories. How they are improving IBM 3270-compatible terminals.

Multifunction terminals. An examination of the trend to combine the traditional functions of data entry and remote batch terminals.

Latest vendor moves in intelligent terminals, and how users can best make the intelligence pay.

OCT. 7

A.M.: DATA TRANSMISSION SERVICES

Carriers. Leading users explain their rationale for selecting services from various carriers.

Tariffs. A study of Bell's latest tariffs, including MPL and DDS, with the latest on its switched digital offerings.

Satellites. A review of the services and tariffs of specialized and satellite carriers.

Value-added carriers. A tutorial on packet-switched services with a rundown on tariffs and carrier plans.

International services. A look at how they stack up for data communications in light of recent moves by the FCC and the international record carriers.

P.M.: MODEMS AND MULTIPLEXERS

Evaluations. Users assess modems and multiplexers and trace their trade-offs in making evaluations.

Latest developments with high-speed modems and the trend to intelligent multiplexers.

Post-DAA view of medium- and low-speed modems and the changes users can expect with digital transmission services.

Network diagnostics. Users outline their equipment selection and network management procedures for ensuring minimum system downtime.

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Make a good living where the living is good. There's no question—living is good in the Dallas area. Our public school systems have earned national recognition for excellence. We're one of the fastest growing areas in the nation, yet our housing dollar stills buys considerably more home in Dallas than it would in most other metropolitan areas. We're surrounded by lakes, and blessed by beautiful weather year 'round. We back professional, university, and high school athletic teams, and we support our symphony, theaters, the civic opera and several museums. But, best of all, most of us are down home friendly people.

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We're looking for outstanding programmers. People who can step into lead and associate positions to interface special purpose hardware with computers in real time state-of-the-art systems. Requires 5 to 10 plus years experience in the production and test of product software for real time/near real time/process control or data base management applications. Special emphasis will be placed on experience with IBM 370 assembly language under OS/MVT and 16 bit mini-computers ALC. Experience with the production of product software to support electronic systems in government procurements is highly desirable.

Software Systems Acceptance Test Engineers

Positions are open for Test Engineers with 2 to 10 years experience in the formal acceptance testing of software systems. This experience should include the development of test concepts, test plans, formal test procedures and test software. Experience in conducting formal acceptance tests and the analysis of test results is highly desirable. Positions are open for personnel with IBM 370 software testing experience as well as 16 bit mini-computer software testing. Real time experience desirable but not necessary.

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If you qualify, send your resume with salary history to:
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PROJECT LEADERS and PROGRAMMERS

The Information Sciences Division of the Rockland Research Institute is seeking dynamic and innovative Programmers at all levels to help continue its leadership in the development and implementation of clinical, administrative and management-oriented information systems in the Mental Health field.

Sr./Lead Programmer

This position requires proven leadership ability, in-depth knowledge of PL/1, DL/1 (or similar OMBS), Telecommunications and OS JCL. The individual must have a Masters Degree in Computer Science or any related field. Familiarity with COBOL and BAL a plus. Salary in the upper teens.

Programmer

This position requires experience in PL/1, and OS JCL and the ability to do independent work. A Bachelors Degree in Computer Science or any related field is required. Salary in middle teens.

Junior Programmer

This entry level position requires a College Degree and at least a working knowledge of PL/1, COBOL, and/or BAL.

Send resume and salary history in confidence to:
William A. Zeltz, Ph.O.
Director, Applications Programming
INFORMATION SCIENCES DIVISION

Rockland Research Institute

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Data Communications Field Sales Manager

RCA Service Company has an immediate requirement in the Cherry Hill home office for an experienced Data Communiations Sales Manager to provide direction and support to our expanding field sales force.

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Professional sales managers interested in an excellent growth opportunity should submit resume, including salary requirement, to: Mr. S.W. Gaary, RCA Service Company, Cherry Hill Offices, Bldg. 201-2, Camden, N.J. 08101.

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RCA

SYSTEMS & PROGRAMMER ANALYSTS

Continuing corporate growth and expansion of our client's processing operation in an OS environment has created immediate openings for systems and programming personnel. They are searching for talented individuals with backgrounds in the development of computer based systems for manufacturing control applications. They are building an integrated manufacturing system which includes financial and marketing.

SYSTEMS ANALYST

5 years analyses experience with emphasis on design in bill of materials, budgeting, cost accounting and inventory.

SENIOR PROGRAMMER ANALYST

4 years programming experience in COBOL required. CICS DL/1 and/or IMS helpful.

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2 years experience in development and implementation of computer programs using ANSI COBOL, IMS data base and OS/VS.

Our client has locations in the east and midwest. For further information, call ART GOEHRING collect at (614) 885-8917.

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You will assist in developing, installing and maintaining all software. Including: Operating Systems, IMS data base, interactive systems and program products for a corporate computer center with multiple 370's serving multiple divisions.

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Immediate opening for individual with minimum 5 years in design and implementation of business systems under ANS COBOL. Capable of functioning as a team member and interface with all levels of management. Experience as a working supervisor or work group leader is required.

IBM OS data base and telecommunications particularly valuable. Construction or manufacturing background helpful.

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Seeking individual to develop graphics applications for scheduling systems. Minimum 3 years with FORTRAN and incremental plotting software. Education should include BS degree in mathematics or equivalent in experience.

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Requirements are a B.S. degree in a technical area, preferably E.E. Masters degree or MBA is desirable but not required. The applicant should have a minimum of 5 years computer systems or related experience with at least 2 years in data communication or telecommunication.

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Send Resumes To:
Barry Maser, VP/Marketing

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Rapid growth at OCLC, a national computerized bibliographic data exchange results in current employment opportunities. OCLC utilizes Xerox Sigma equipment and has one of the larger leased line synchronous multidrop communications networks in the nation.

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In these positions we prefer you have experience in Management Information Systems or Insurance Processing Systems for Casualty, Personal or Commercial Lines. You should also be able to communicate effectively with all levels of management and systems personnel.

SENIOR PROGRAMMER/ANALYSTS

Experience in implementation of an on-line Life Insurance Processing Systems. The ideal applicant will possess in-depth Life Insurance experience, with emphasis on Policy Holder Service or Actuarial and a strong technical background which includes proficiency in BAL, COBOL and OS-JCL.

DATA BASE/DATA COMMUNICATIONS ANALYST

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Interested individuals should submit resumes to: R.V. Carswell, Computer Science Technology, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

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Annual full-time rate $12,000. Position is 3/4 time through 30 June 1977, 1/2 time for following 12 months.

Chief programmer, real time applications in project involving minicomputers and microcomputers in laboratory experimentation in the physical sciences. Should be experienced in compiler design; structured programming techniques; assembly language programming; systems software in time-sharing environment including networked, distributed, real time, remote processors; hardware interface design and specification.

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Programmers

The University of New Mexico Computing Center in Albuquerque has openings for the following positions:

Applications Programmer

Knowledge of IBM, OS, JCL and at least 2 high level languages (FORTRAN, COBOL, PL/2 or assembler) required. Successful applicant must have at least one year experience as a programmer. Bachelor's degree or equivalent in experience. Starting salary range: $8,674 - $11,253.

Sr. Applications Programmer

Knowledge of IBM, OS/MVT, JCL and at least 2 high level languages (FORTRAN, COBOL, PL/1 or assembler) required. Must have at least 2 years experience as a programmer. Bachelor's degree or equivalent in experience. Experience as a lead programmer desirable. Starting salary range: $9,568 - $12,251.

Sr. Systems Programmer

Generate, maintain, modify, document and consult (All on OS/HASP). Assembler language and 2 high level languages required. Bachelor's degree or equivalent in experience plus 3 years systems programming experience. Knowledge of 360 architecture. Starting salary range: $14,123 - $17,784.

The University of New Mexico is located in the heart of the "Land of Enchantment". Although it is among the least densely populated states, New Mexico boasts a richly textured heritage in 3 major cultures - Indian, Hispanic, and Anglo. These traditions still flourish and are explored through the gamut of artistic endeavors from the Santa Fe Opera to the numerous galleries and craft shops in Santa Fe and Taos. The enchantment of the arts is second only to the land that inspires and informs them. New Mexico's excellent climate graces the raw beauty of the moonlit desert and the alpine meadows in the mountains. And in winter, the numerous ski slopes make New Mexico a land of year round enjoyment.

Send resume and salary requirements to: Director of Computing Center, University of New Mexico, Albuquerque, New Mexico 87131.

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The ideal candidate will have a thorough knowledge of MDQS, IDS, and ISP. A strong data base background on other equipment will be considered. Occasional travel, possibly including foreign travel, will be required.

Please call Al C. Stauffer at (617) 658-6100 or send a resume to his attention at the address below.

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CSC
Data Processing Professionals EUROPE

Computer Sciences International-Europe, is a wholly-owned subsidiary of Computer Sciences Corporation of El Segundo, California, the world's leading independent consulting firm in the information sciences. Heedquartered in Brussels, CSI directs or assists data processing projects and merketing efforts through corporations in Germany, The Netherlands, France end the United Kingdom.

The continuing growth of CSI's business has created the need for additional, permanent staff, for both immediate project requirements and for anticipated expansion over the next six months. The majority of the positions to be filled are for data processing consultants, who can be effective dealing directly with customer's management and their personnel, usually on-site.

These assignments for permanent cadre (with family) are for long-term, indeterminete periods and will be offered as one-way relocations on National Status contracts only. Employment contracts will state gross ennuel salaries in local (European) currencies plus normal appropriate relocation reimbursements.

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- Systems Programming (large-scale hardware)
- OS Design and Development
- Compiler Design and Development
- VS/9
- Software Test and Integration
- Date Communications and TP
- Data Base Managmeent
- Process Cotnrol Applications
- Data Entry, Order Handling and Inventory Systems
- Hospital and Medical Diagnostic Systems
- Banking, Insurance and Reservations Systems
- Police Communications Systems
- On-line, Real-time, Interactive Command & Control Systems
- Systems Engineering and Systems Management Related to Automated Transportation Systems, e.g., Air Traffic Control

Essential for consideration for these assignments is fleuency (not ability) in German, Dutch or French. Present citizenship is relevant only to the extent it would effect your ability to obtain a visa and/or work permit from the host country.

Responses, which will be treated in confidence, should include a complete summary of education end work experience; family status (number and ages of children); lenguage fluencies; candidate's and spouse's citizenship; present earnings end expected compensation; date of availability end European location preference (if any).

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Director, Internationel Personnel

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The individuals we seek must hava e strong background with IMS/VS DB/DC systems. This background should include tuning, performanca monitoring and applicatioo design interece. Knowladge of IMS internals and administrative experience very desirable.

SYSTEMS PROGRAMMING

Tha individuals we seek must have prior experience with IBM 370 operating systams. Experianca with SVS, MVS, HASP and/or data communicetions would be beneficiel.

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West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), Sen Francisco (415/434-2410).

SENIOR MARKET ANALYST

Masters degree and quantitative methods or statistics are required. Computer programming experience and 1 to 3 years experience in a consumer package goods research department or a marketing research supplier organization is desired. A mathematics or accounting undergraduate program would be helpful.

For an interview appointment, please call (713) 861-4411, or send resume in confidence to our personnel department.

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Intercomm Systems Programmer

U.S. Energy Research and Development Administration in Albuquerque New Mexico is seeking a Systems Software Programmer with a minimum of 2 years' experience in OS/MVT and minimum of 1 years' experience as INTERCOMM Systems Programmer. Work involves maintaining INTERCOMM system tables and writing and maintaining local modifications to INTERCOMM. Experience with COBOL programming desired. ASSEMBLER programming is necessity. Salary $16,255 to $20,678. Please send resume to Stephan G. Buswall at: U.S. Energy Research and Development Administration, P.O. Box 5400, Albuquerque, N.M. 87115. *An equal opportunity employer.*

PROGRAMMER

(ANS COBOL)

R.J. Raynolds Industries, Inc., has an opening for a Data Processing Programmer. The position would report directly to a Systems Manager, R.J. Raynolds Industries, Inc., Systems Department.

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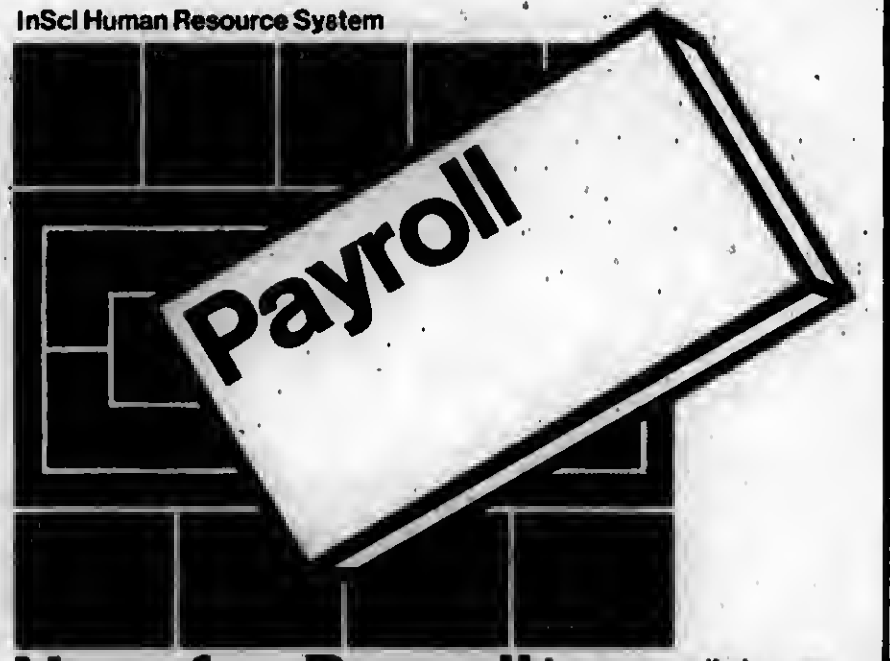

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But Fall in Half-Year

NCR Earnings Take Upswing in Quarter

DAYTON, Ohio – Although NCR Corp.'s earnings continue to be adversely impacted by the performance of several major subsidiary companies abroad and by higher expenditures for R&D, both revenues and earnings rose in the second quarter.

Six-month earnings fell 19% despite a 3.2% rise in revenues.

Earnings for the quarter totaled $18.5 million or 75 cents a share compared with $18.4 million or 76 cents a share in the year-ago period. The second quarter figure was up substantially, however, over the first quarter's earnings of $13.2 million.

Second-quarter revenues were $556.2 million compared with $471.1 million in the first quarter and $516.5 million in the second quarter of 1975.

Half-year revenues grew to $1.03 billion compared with $995.4 million in the year-ago period, but earnings fell to $31.7 million or $1.29 a share from $39.3 million or $1.62 a share in the 1975 six months.

Earnings in the half-year were favorably affected by an adjustment of $5.6 million from adoption of accounting changes involving the translation of foreign currency financial statements.

"The earnings upturn in the second quarter reversed an adverse trend which began a year ago as a result of sluggish business conditions both domestically and abroad," according to William S. Anderson, chairman and president.

NCR's profitability is also benefiting from increased manufacturing schedules which have alleviated some of the pressure on earnings caused by excess manufacturing capacity, he added.

Domestic bookings through June 30 were substantially ahead of last year's comparable period, with foreign orders close to last year's level.

Honeywell Net Rises in Quarter

MINNEAPOLIS – Honeywell, Inc.'s second-quarter earnings showed a substantial improvement over those of the comparable year-ago period, but the firm said it does not expect the trend to continue.

Meanwhile, half-year earnings more than doubled.

Second-quarter earnings totaled almost $19.4 million or 86 cents a share compared with $12.7 million or 51 cents a share in the 1975 period.

Revenues grew to $702 million compared with $608 million in the year-ago period.

Six-Month Earnings

For the six months, earnings jumped to $32.9 million or $1.49 a share from almost $13.8 million or 42 cents a share in the 1975 half-year.

Revenues were $1.3 billion compared with $1.28 billion in the year-ago six months.

Edson W. Spencer, president and chief executive, said he does not expect the high quarterly earnings increase over 1975 to continue in the second half because last year's third and fourth quarters were relatively strong, benefiting from both the start of economic recovery in the U.S. and a new accounting standard for translation of foreign currency.

Worldwide bookings of Honeywell's computer systems were substantially greater than the first quarter of 1976 and nearly matched the second-quarter record established in 1975.

Computer bookings for the first six months lagged the comparable 1975 period.

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Advanced Computer Techniques has declared its first dividend of 5 cents.

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Telex Corp. has extended the expiration date of its outstanding warrants to purchase 962,500 shares of its common stock until Nov. 1, 1977.

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Bolt Beranek and Newman, Inc. has declared a semiannual dividend of 10 cents a share payable Aug. 31 to holders of record Aug. 16.

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MCI Communications Corp. has revised its credit agreement with five banks to defer payments of interest that begin to come due this month until April 1977.

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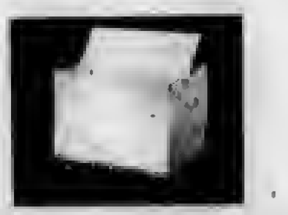
Courier Terminal Systems, Inc. has increased its revolving line of credit to $20 million with Wells Fargo Bank.



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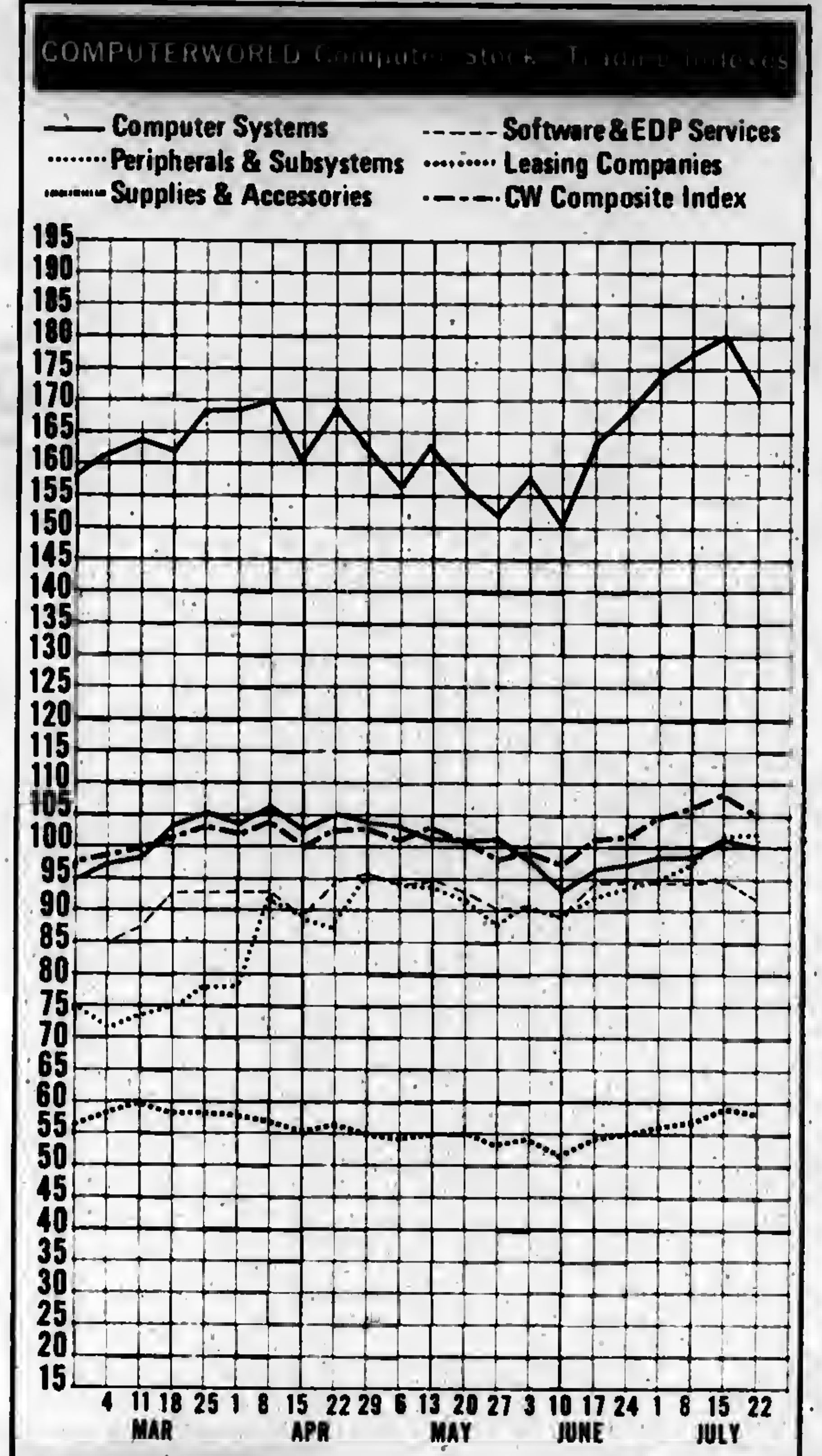
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Nine Months Ended March 31

	1976	1975
Shr Ernd	$.57	$.54
Revenue	9,387,942	5,788,033
Tax Cred	69,202	250,000
Earnings	637,979	568,306

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Three Months Ended March 26

	1976	1975
Shr Ernd	$.42	$.30
Revenue	2,267,000	1,955,000
Earnings	223,000	158,000

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Year Ended Dec. 31

	1975	1974
Shr Ernd	$.70	$.51
Revenue	9,240,000	8,109,672
Tax Cred	460,000	320,000
Earnings	1,122,479	794,248

COMPUTER TASK GROUP
Three Months Ended March 31

	1976	1975
Shr Ernd	$.04	$.07
Revenue	1,050,929	954,313
Tax Cred	.....	27,345
Earnings	31,992	56,071

COMPUTER TRANSCEIVER SYSTEMS
Year Ended Feb. 29

	1976	1975
Shr Ernd	$.39	$.58
Revenue	4,471,455	4,755,498
Tax Cred	82,080	246,700
Earnings	355,544	527,486

DATATAB
Three Months Ended March 31

	a1976	1975
Shr Ernd	$.10	.....
Revenue	1,333,620	$1,158,046
Earnings	77,085	1,463

a-Restated to reflect $24,000 reduction in income tax provision due to investment credit.

DIGITECH
Three Months Ended March 31

	1976	a1975
Shr Ernd	.....	$.04
Revenue	$1,116,548	1,281,374
Tax Cred	.....	24,000
Earnings	(70,314)	61,433

a-Restated to reflect full effects of liquidation of joint-venture GUS-Digitech, Inc.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 21, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUL 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	101 1/4	-2 3/4	-2.6
O	COMPUTER AUTOMATION	10- 19	16 7/8	- 1/2	-2.8
N	CONTROL DATA CORP	18- 27	23 7/8	-1	-4.0
N	DATA GENERAL CORP	40- 60	53	-2 5/8	-4.7
O	DATAPOINT CORP	24- 46	42	-3 1/2	-7.6
O	DIGITAL COMP CONTROL	2- 7	6 1/2	- 3/4	-10.3
N	DIGITAL EQUIPMENT	138-181	171 1/4	-7 1/2	-4.1
N	ELECTRONIC ASSOC.	2- 3	3	+ 1/8	+4.3
A	ELECTRONIC ENGINEER.	7- 16	9 3/8	- 3/8	-3.7
N	FOXBORO	28- 46	43 3/8	- 3/8	-0.8
O	GENERAL AUTOMATION	3- 11	6 1/4	- 3/4	-10.7
O	GRI COMPUTER CORP	1- 1	3/8	0	0.0
N	HEWLETT-PACKARD CO	93-117	107 3/4	-8 7/8	-7.6
N	HONEYWELL INC	34- 36	48 3/8	-3 1/8	-6.0
N	IBM	227-280	271	-5 5/8	-2.0
O	MANAGEMENT ASSIST	1- 3	2 1/4	+	+2.7
O	MEMOREX	18- 33	27 1/8	-3	-9.9
O	MICRODATA CORP	10- 27	23 3/4	-2	-7.7
C	MODULAR COMPUTER SYS	9- 14	11 1/4	-1 1/4	-10.0
N	NCR	24- 36	33 1/4	-1 7/8	-5.3
O	PRIME COMPUTER INC	4- 13	12 1/2	+ 1/4	+2.0
N	PERKIN-ELMER	19- 27	23 1/4	-1 1/2	-6.0
N	RAYTHEON CO	43- 66	62 3/4	-2 1/4	-3.4
N	SPERRY RAND	40- 32	48 1/4	-2 1/2	-4.9
O	SYCOR INC	20- 31	23 3/4	-2 1/2	-9.5
A	SYSTEMS ENG. LABS	6- 10	9	- 7/8	-8.8
N	VARIAN ASSOCIATES	13- 17	13	-1 1/4	-7.8
A	WANG LABS.	11- 20	16 1/8	-1 1/4	-7.1

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUL 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	0	0.0
A	COMMERCE GROUP CORP	2- 3	3	+ 1/8	+4.3
A	COMPUTER INVSTRS GRP	1- 3	1 3/8	- 1/8	-7.1
N	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	3/8	0	0.0
N	DPF INC	3- 8	7 1/2	- 3/8	-7.6
A	GREYHOUND COMPUTER	3- 8	7 3/8	0	0.0
N	ITEL	6- 13	13 3/4	- 7/8	-3.9
N	LEASCO CORP	6- 19	14 3/4	-3	-16.9
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	1/2	+ 1/8	+33.3
A	PIONEER TEX CORP	6- 9	7 3/4	0	0.0
N	U.S. LEASING	7- 12	10 3/8	- 7/8	-7.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUL 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	0	0.0
O	ANACOMP INC	9- 11	8 7/8	- 1/8	-1.3
A	APPLIED DATA RES.	2- 4	3 3/8	- 3/8	-9.3
N	AUTOMATIC DATA PROC	17- 35	33 1/8	-1 5/8	-4.6
O	COLEMAN AMERICAN COS	3- 6	3	- 1/8	-4.0
O	COMPUTER DIMENSIONS	3- 7	4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	7	- 1/4	-3.4
O	COMPUTER HORIZONS	1- 2	2	- 1/4	-11.1
O	COMPUTER NETWORK	2- 6	3 3/8	- 1/8	-3.5
N	COMPUTER SCIENCES	4- 8	6 7/8	- 1/4	-3.3
C	COMPUTER TASK GROUP	1- 1	1 1/3	0	0.0
C	COMPUTER USAGE	3- 6	3 1/4	- 1/8	-3.7
O	COMSHARE	2- 9	8	- 1/4	-3.0
O	DATA DIMENSIONS INC	2- 4	3	- 3/8	-11.1
O	DATATAB	1- 1	1	+ 1/3	+14.2
N	ELECTRONIC DATA SYS.	12- 16	13 1/2	+ 1/8	+0.9
O	INFORMATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	3 3/8	0	0.0
O	KEYDATA CORP	3- 3	2 1/2	- 1/8	-4.7
O	LOGICON	4- 4	3 1/2	0	0.0
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 23	21 3/4	-1 3/4	-7.4
A	ON LINE SYSTEMS INC	18- 22	18 7/8	- 3/8	-1.9
N	PLANNING RESEARCH	3- 3	3 3/4	- 1/4	-6.2
O	PROGRAMMING & SYS	1- 1	3/8	- 1/8	-23.0
O	RAPIDATA INC	3- 3	2 1/2	- 3/8	-13.0
O	REYNOLDS & REYNOLDS	13- 21	17 1/4	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	1/2	0	0.0
O	TYMSHARE INC	19- 28	23 1/2	-1 3/8	-3.1
A	UPS SYSTEMS	3- 3	3 3/4	+ 1/8	+3.4
N	WYLY CORP	2- 7	3	- 1/8	-4.0

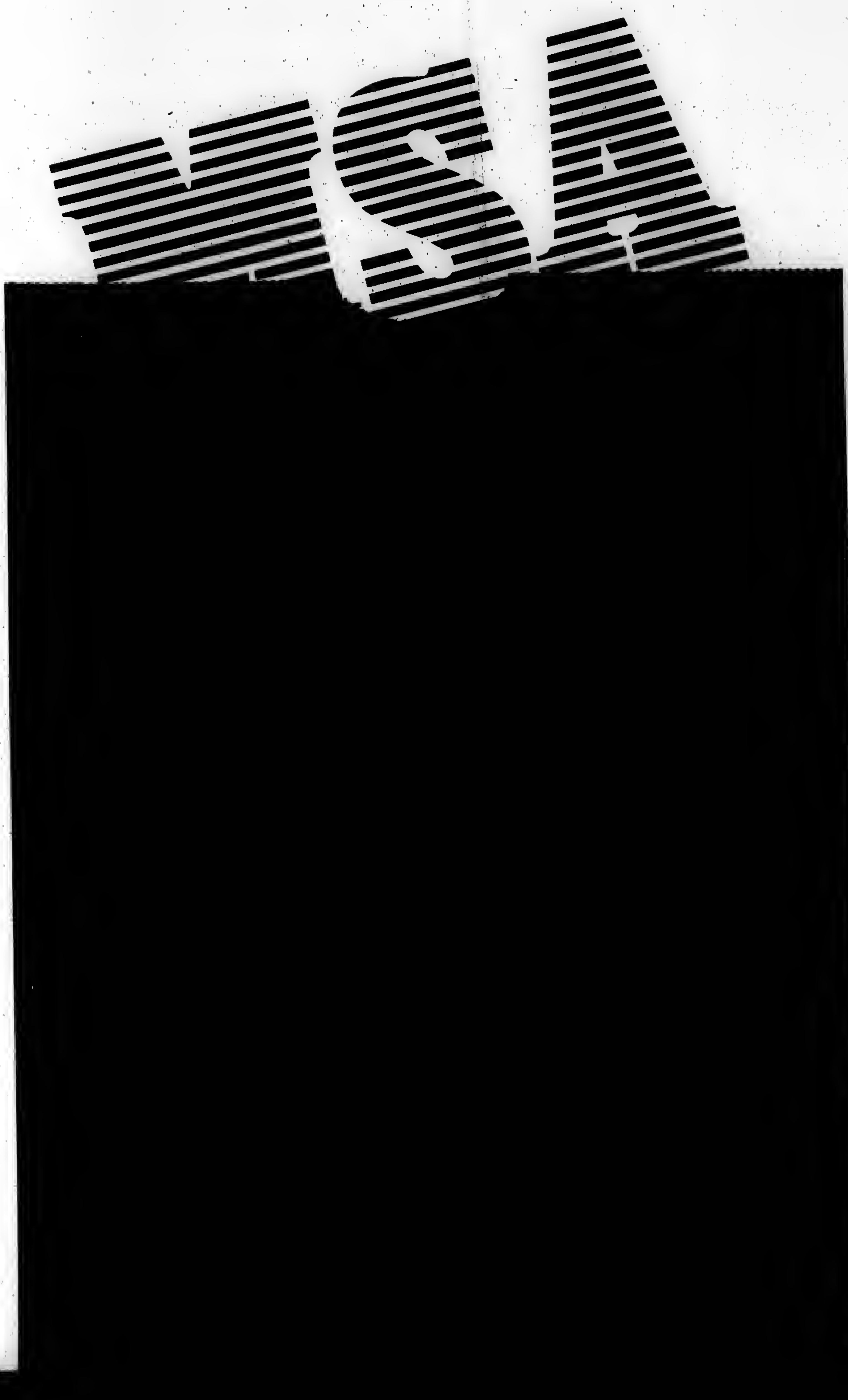
PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUL 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10 3/8	- 3/4	-6.7
O	ADVANCED MEMORY SYS	4- 10	8 1/4	- 1/4	-2.9
N	AMPEX CORP	3- 10	9 1/4	0	0.0
O	ANDERSON JACOBSON	2- 4	2 3/4	- 3/8	-12.0
O	APPLIED DIG DATA SYS	13- 23	23 1/2	- 3/4	-3.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 3/4	+ 1/4	+2.9
A	BOLT,BERANEK & NEW	7- 11	9 3/8	- 1/4	-2.5
N	BUNKER-RAMO	5- 10	9	- 1/4	-2.7
A	CALCOMP	4- 7	5 3/8	- 7/8	-13.4
O	CAMBRIDGE MEMORIES	1- 6	1 3/8	0	0.0
N	CENTRONICS DATA COMP	20- 36	33 1/8	+1	+3.1
O	CODEX CORP	22- 42	32	+ 1/2	+1.5
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 3	3 3/4	- 1/8	-3.2
O	COMPUTER CONSOLES	4- 7	3 3/4	- 1/4	-4.1
A	COMPUTER EQUIPMENT	1- 3	1 3/4	- 1/8	-6.6
O	COMPUTER TRANSCEIVER	1- 3	1 1/4	0	0.0
O	COMTEN	4- 9	8 1/2	- 1/2	-3.3
N	CONRAC CORP	20- 25	23 3/4	- 3/8	-2.3
O	DATA ACCESS SYSTEMS	1- 4	3 1/4	- 1/4	-7.1
O	DATA 100	7- 13	8 3/4	- 1/4	-2.7
A	DATA PRODUCTS CORP	3- 14	13	- 3/8	-2.8
O	DATA TECHNOLOGY	1- 2	1 1/2	- 1/8	-7.6
O	DATUM INC	1- 2	2	0	0.0
O	DECISION DATA COMPUT	1- 4	1 7/8	+ 1/8	+7.1
O	DELTA DATA SYSTEMS	1- 1	7/8	+ 1/8	+16.6
N	ELECTRONIC M & M	1- 3	3	- 1/4	-7.6
O	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/8	- 3/8	-3.8
N	HARRIS CORP	34- 32	31 1/4	- 1/2	-0.9
A	INCOTERM CORP	9- 20	11 3/4	- 1/4	-2.0
O	INFOREX INC	3- 7	3 7/8	- 1/8	-3.1
O	INFORMATION INTL INC	19- 18	12 7/8	- 3/8	-4.6
O	INTEL CORP	60-109	67	-3 1/2	-4.9
A	LUNDY ELECTRONICS	4- 7	4 5/8	+ 1/4	+3.7
O	MSI DATA CORP	3- 7	6 7/8	- 1/4	-3.5
A	MILGO ELECTRONICS	15- 21	18 1/2	- 1/8	-0.6
N	MOHAWK DATA SCI	3- 9	8 3/8	- 7/8	-9.4
O	PENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	6	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTOR CORP	4- 6	3 1/4	- 1/4	-4.3
O	RECOGNITION EQUIP	6- 11	8 1/2	- 1/4	-2.8
N	SANDERS ASSOCIATES	6- 11	9 3/4	0	0.0
O	SCAN DATA	2- 4	2 3/8	- 1/8	-3.0
O	STORAGE TECHNOLOGY	9- 13	12 1/2	- 3/8	-2.9
O	T BAR INC	3- 16	6	+ 1/3	+2.1
O	TALLY CORP.	4- 6	3 1/4	+ 1/2	+10.3
O	TEC INC	3- 3	3 1/2	0	0.0
N	TEKTRONIX INC	43- 66	66 1/4	+2 1/4	+3.3
N	TELEX	2- 5	3 3/8	- 3/4	-17.1
O	WANGCO INC	11- 22	21 1/4	0	0.0
O	WILTEK INC	2- 2	2 3/4	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE JUL 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	4- 3	3 1/2	0	0.0
A	BARRY WRIGHT	6- 10	7 3/4	- 1/4	-3.1
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	31- 42	31	-1 3/8	-4.2
O	DUPLEX PRODUCTS INC	15- 24	14 1/2	- 1/2	-3.3
N	ENNIS BUS. FORMS	6- 8	8 3/4	+ 1/8	+1.8
O	GRAHAM MAGNETICS	8- 13	9	0	0.0
O	GRAPHIC CONTROLS	13- 19	14 3/4	0	0.0
N	3M COMPANY	33- 83	38 1/2	-3 3/8	-3.8
O	MOORE CORP LTD	40- 51	42 1/4	- 1/4	-0.5
N	NASHUA CORP	11- 17	16 1/8	0	0.0
O	STANDARD REGISTER	13- 19	15 1/4	-1	-6.1
O	TAB PRODUCTS CO	3- 11	10 1/2	+ 1/2	+3.0
N	UARCO	21- 25	21 1/2	0	0.0
A	WABASH MAGNETICS	4- 8	7 1/2	- 1/2	-6.2
N	WALLACE BUS. FORMS	19- 23	20 1/2	+ 1/4	+1.2

SHOPPING FOR FINANCIAL SOFTWARE?
TALK WITH THE INDUSTRY LEADER.



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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1976 by Computerworld, Inc.
year August 2, 1976 Vol. X, No. 31

NEWSPAPER

News Update

Comments Move Ansi To Enhance Fortran

WASHINGTON, D.C. – Four statements have been added to the draft of the proposed Fortran standard revision and "together [they] provide the capability to conditionally execute groups of statements," according to a spokesman for American National Standards Institute's (Ansi) X3J3 committee.

The need for the facilities supported by the block IF, ELSE IF, ELSE and END IF statements "was strongly presented" in many of the comments received since X3J3's proposal was released for public review earlier this year [CW, April 12], the committee said.

By mid-July, 200 letters totaling 810 pages had been received and the overwhelming majority were favorable, the spokesman added.

According to Ansi procedures, each suggestion is being evaluated to determine if a change should be made in the draft standard.

The committee will continue its review of puhlic comments at its next meeting in September. The public review and comment period closes Sept. 28.

Stay Lets Ill. Banks Continue With CBCTs

CHICAGO – Yet another page in the story of electronic funds transfer has slowly been turned.

U.S. Supreme Court Judge John Paul Stevens has issued a stay order permitting Continental Illinois National Bank and Trust Co. and the First National Bank of Chicago to continue operating their customer-bank communications terminals (CBCT) until the Supreme Court decides whether to hear their case.

The two Illinois banks are appealing an earlier U.S. Court of Appeals ruling that CBCTs constitute branch banks, which are illegal under Illinois law [CW, July 5].

In related legislation, the City of Chicago council passed a Community Bank Ordinance sponsored by Mayor Richard J. Daley.

The bill, passed under a home-rule measure, would permit Chicago banks to open six community offices and operate an unlimited number of automatic tellers.

Continental and First National have filed in Cook County Circuit Court to have the city ordinance declared constitutional.

At the same time, the Illinois Bankers Association has filed to have it declared unconstitutional.

No dates have been set for court hearings.

Worth the Court Battles?

IBM Admits Many Papers Not Privileged

By Edith Holmes
Of the CW Staff

NEW YORK – They've been fought over from district court to appeals court, but many of them weren't worth the fight, it now appears.

"They" are the 20,000 documents IBM has been trying to keep out of the hands of the Justice Department, which is currently trying the U.S. government's antitrust case against the firm.

Between 30% and 40% of those documents are either not privileged – as IBM had claimed – or are so old or of such little consequence they can be turned over to the government immediately, IBM attorneys said last week.

Following the denial of an IBM request for protection of the documents by the U.S. Second Circuit Court of Appeals here recently [CW, July 26], lead IBM attorney Thomas D. Barr reviewed the documents and found as many as 8,000 did not require any protection, he told the court last week.

Barr told Judge David N. Edelstein another 50% to 60% of the documents could be dealt with through a protective order that would proscribe how the government handled the documents once they were turned over by the company.

Only 10% of the 20,000 documents IBM has claimed as privileged in this latest round would require review and a ruling by the judge to determine whether they were materials that fall into the category of privileged documents.

An Ongoing Battle

The battle over privileged documents has gone on since before the now-14-month-old trial ever started.

In an earlier brouhaha, IBM claimed another group of around 20,000 documents were covered by the attorney-client privilege. These documents had "inadvertently" been turned over to Control Data Corp. when it was preparing its case against IBM, IBM said, contending they should not have to be turned over to the government.

On that occasion, Edelstein ordered the firm to turn the documents over and fined the firm $150,000 per day for contempt for not relinquishing the documents.

IBM appealed that decision all the way to the Supreme Court, but was rebuffed and turned the documents over to the Justice Department. The Supreme Court did not rule whether the documents were privileged, but rather said IBM should wait to raise such issues until after the entire case was over.

On almost all of the documents in question, IBM had contended they were specifically written to help guide the lawyers in preparing for this or other cases or that

(Continued on Page 4)

Survey Shows 55% of Consumers Oppose Bell-Backed Reform Act

By Ronald A. Frank
Of the CW Staff

CAMBRIDGE, Mass. – More than half the consumers questioned in a recent survey are opposed to the AT&T-conceived Consumer Communications Reform Act.

The public response was part of a random survey conducted hy The Yankee Group, a consulting firm here. Ahout 550 consumers were contacted by phone and mail in 30 urban and suburban areas served by Bell System operating companies in various parts of the country.

Fifteen states were represented in the survey, which was completed within the last month, according to a Yankee Group spokesman.

About 55% of the consumers said they were opposed to the legislation which is now pending in various versions before hoth houses of Congress. Of those questioned, 34% said they supported the act and 11% were undecided.

Three Questions Posed

Three questions were asked, with the first explaining the proposal and asking whether the consumer was in favor. If the respondent said no, he was asked whether his answer would change if passage of the act resulted in a "minor or modest" decrease in monthly phone bills.

About 62% of the negative respondents said a decrease in their phone bill would not alter their opposition; 23% would he in favor; and 15% would he undecided under those circumstances.

A third question was whether the consumer had previously heard of the legislation, and only 12% said they were familiar with the bill.

The Consumer Communications Reform Act was first proposed before the House of Representatives in March [CW, March

(Continued on Page 4)

Misuse of SSNs by Government Possible Under Tax Reform Bill

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Protection from government misuse of Social Security numbers (SSN), provided by the Privacy Act of 1974, could be eliminated by a provision of the Tax Reform Act of 1976.

Added by the Senate Finance Committee and debated here on the floor of the Senate last week, Section 205(C)(i) of this omnibus tax reform act would permit any state or political subdivision "in the administration of any law or program within its jurisdiction [to] utilize the Social Security account number . . . for the purpose of establishing the identification of individuals affected by such law or program."

Agencies could also "require any individual who is or appears to be so affected to furnish . . . [his] Social Security account number."

This would not only authorize state and local government agencies to begin using the SSN as a universal identifier, but also would encourage unrestricted use of the number, some critics believe.

Only two years ago, Congress, fearing the SSN was becoming a de facto universal identifier, made it unlawful for a federal or state agency to deny to any individual any right, benefit or privilege provided by law because of that individual's refusal to disclose his SNN.

'Grandfather Clause'

To avoid wholesale conversion of government information systems, drafters of the Privacy Act of 1974 saw fit to include a "grandfather clause" exempting systems in existence and operating before Jan. 1, 1975, if such disclosure had been authorized by statute or regulation adopted prior to that date.

As a result, agencies already requiring the SSN could continue to do so, but agencies could not require it for new systems of records.

The provision, is being pushed by Sen. Russell B. Long (D-La.) who "insists" it is impossible to enforce his parent locator law and "catch welfare cheaters" without it, a Congressional staff member said. However, the Parent Locator Service was

(Continued on Page 4)

Computerworld Enlarges Family

LONDON – Two publications have been added to the worldwide Computerworld, Inc. family of publications – *Computer Management* and *Export Direction*.

The two monthlies were acquired from Special Interest Publications Ltd. (SIP) and will be run by a new company within Computerworld Publishing Ltd., an existing UK subsidiary.

The managing director for the new company will be Tony Vickers, currently a director of SIP. Donald R. Ingleton, previously managing director of SIP, will join the firm as a director.

The majority of the two publications' employees will remain under the arrangement.

The monthlies join *Computerworld* in the U.S., *Shukan Computer* in Japan, *Computerwoche* in Germany and *DataNews* in Brazil as members of the Computerworld, Inc. publications group, providing the firm with an international information gathering and dissemination capability.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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With No Witnesses on Stand

IBM Judge Makes Himself Scarce...

By Edith Holmes
Of the CW Staff

NEW YORK – There's never been a jury in the U.S. government's antitrust case against IBM. These days there's hardly a judge.

For the better part of the last two weeks of trial, Judge David N. Edelstein has stayed in his chambers, catching up on work in this and other cases, while the parties read deposition and document testimony into the record in Courtroom 110 of the Federal Courthouse here in Foley Square.

The judge made his decision to conduct the trial by reading the daily transcripts rather than by presiding over each day's proceedings when he learned the Justice Department probably won't call another witness to the stand until the end of September or the beginning of October.

Upon hearing the "fighting machines" or "product announcements" portion of the government case dealing with IBM's conduct in the marketplace would rely primarily on some six depositions and as many as 1,000 documents, Edelstein asked, "Does that suggest that there will not be any live witnesses of any consequence for the next few months?

"You mean I am just going to sit here and listen to depositions?"

When he received confirmation of his fears, he asked, "Why? Is this for the convenience of witnesses or the convenience of counsel?"

The lead Justice Department attorney for the case, Raymond M. Carlson, assured Edelstein the government's plans aren't designed to suit anyone's convenience.

"That's the way it falls, Your Honor," he said in a recent robing room conference.

When the judge did return at the end of the first day of this procedure, in authoritarian fashion and with a benevolent tone, he asked the parties if they had any problems to report.

"No, Your Honor. We have made quite a bit of progress as a matter of fact," Justice Attorney Charles E. Hamilton III, who has overall responsibility for this part of the government's case, responded.

"I am delighted," the court replied.

The truth was the parties *had* made quite a bit of progress in the judge's absence. For the first time in many months of trial, the government was able to stick to its time schedule, finishing everything it said it would for that week – and more. Daily transcripts swelled 40 to 50 pages beyond their typical length.

IBM counsel's objections were either short and to the point or nonexistent. Hamilton read so quickly through the designated portions of the depositions that the court reporters told him he was giving their fingers a workout.

Analysis

After 14 months of trial, the sudden absence of the judge startled some.

One IBM attorney, who entered the courtroom shortly after Edelstein left it, didn't notice the empty green swivel chair behind the bench until he had walked to the end of the long aisle leading into the courtroom. The stunned expression on his face brought laughter from those who had already recovered from their surprise.

Once the humor of the situation faded away, however, the judge's absence raised questions in the minds of those who have to stay and listen to deposition and document testimony.

All of a sudden, the questions came: Why read all these exhibits out loud, only to have them transcribed and retyped into the record by the court reporters? Why not follow some other procedure? Those depositions and documents which bring no objections from one side or the other could simply be incorporated right into the transcript.

The government cites a section of the Publicity in Taking of Evidence Act of the U.S. Code as part of the reason why deposition testimony is read aloud. But both parties agreed they are following this procedure and have been since the trial began in May 1975 because Edelstein ordered it at a now-distant pretrial conference.

It could be that the judge intends to let the parties stew in their own juice – and to refuse to stand by the stove to watch over the broth – in an effort to force the agreement and cooperation he has repeatedly sought from them.

It could be that Edelstein's sense of the history he and this case are making necessitates eliminating all procedures that can later be called excessively innovative for a trial of this magnitude and gravity.

It could be that this procedure is being followed for any number of reasons – but it does come across as a ridiculous waste of trial time.

. . . IBM Counsel Follows Suit

NEW YORK – The judge hearing the U.S. vs. IBM antitrust trial wasn't the only one who wanted to be absent from the courtroom here recently.

IBM's lead counsel, Thomas D. Barr, requested he be permitted not to be present in court every day until Nov. 1 in order to work on this case and the private antitrust suits being brought against the corporation on the West Coast.

And in the same robing room conference with Judge David N. Edelstein, the U.S. government's head lawyer, Raymond M. Carlson, once again raised the specter of his eligibility for retirement next year.

Barr suggested Nicholas deB. Katzenbach, vice-president and general counsel for IBM, take his place in court as the person with absolute authority to speak for the corporation until the attorney from Cravath, Swaine & Moore returns to the courtroom on a full-time basis.

Carlson worried that without Barr to speak for IBM, there would be no one with the authority to make decisions for the defense in the courtroom. He was assured Katzenbach would have such authority.

The government attorney then said he thought the Justice Department might end up with other problems as a result of Barr's request. "But I would like to have an opportunity to discuss it with my superiors because I am, as you know, near retirement age and the same problem may be presented to Your Honor because of me, and I don't know what the implications of that may be," he said.

The judge recalled Carlson has had to discuss court matters with his superiors on sufficient occasions to question his ultimate authority to make decisions on the spot.

"Somebody has to be in this court with authority to make decisions and if you have no authority to make decisions, get somebody who does," Edelstein said.

In addition, he told Carlson, "If you think you can just walk out on this court without my consent because you consider retirement, you have another thought coming."

Ultimately, the judge granted Barr leave on a day-to-day basis and told the IBM attorney he would look to his partners rather than to Katzenbach for decisions which speak for the defense.

And, ultimately, Carlson is the only one of the "principals" in the case who continues to appear in court.

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Decisions

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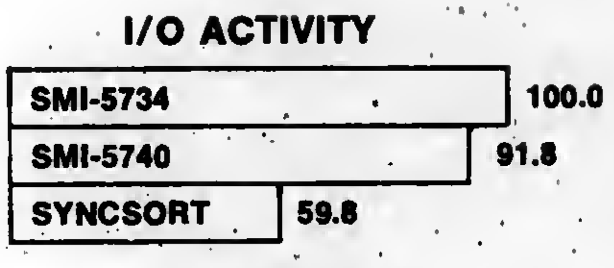

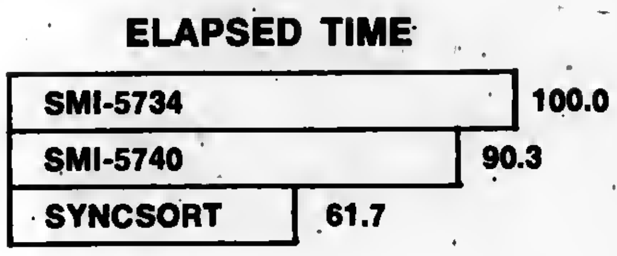

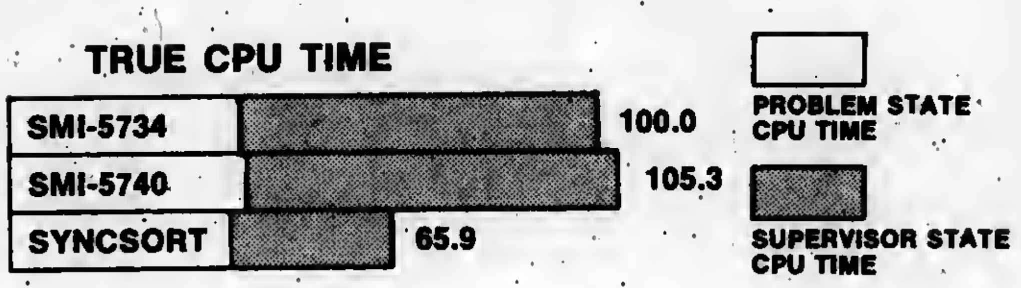

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Bank Found Guilty for Causing Frenchman's Bankruptcy

By Andrew Lloyd

Special to Computerworld

GRENOBLE, France – An appeals court here has awarded a fruit and vegetable wholesaler $275,000 in damages because of an error in a bank's computer system which resulted in his bankruptcy.

Eugene Rochette had been granted an overdraft facility of $24,360. But toward the end of 1973, Credit Lyonnais, France's second largest bank, bounced several of Rochette's checks even though he was still covered by the overdraft.

In addition, it appears Rochette's account was not credited with checks he had deposited.

The news of bounced checks spread fast and Rochette lost both his suppliers and best customers. A few weeks later he was declared bankrupt.

The error by the bank, a large IBM user, is still being isolated, but a spokesman said it seems to have originated from a combination of circumstances.

First there was a software or operational error, "a program bug or an operator entering the wrong code," a bank spokesman said.

But there also seems to have been a communications failure. Rochette's verbally granted overdraft facility was apparently not registered on the bank's regional computing center in Roussillon, which handled his account.

In addition, the whole issue was complicated by a postal strike which held up a bank request to Rochette to put his account back in the black.

As a result, the account was not credited for a period with payments made by Rochette into his account, and the bank began to bounce his checks.

The case was first tried last September, when the bank was ordered to pay $140,000 damages.

The bank appealed, but last week the appeals court not only upheld the conviction, confirming the bank's liability, but almost doubled the damages and ordered the bank to pay 8% interest charges as well.

Credit Lyonnais is still taking stock of the implications of the recent verdict. And, while it was "extremely surprised" by the court's decision, the bank is not considering further appeal, it said.

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Tax Bill Could Bring Government Misuse of SSNs

(Continued from Page 1)

given all the authority it needs to obtain the SSNs of deserting parents by federal regulation, she said.

Another Amendment

At press time Sen. Charles Percy (R-Ill.) had introduced an amendment that would permit state taxing authorities to use the SSN, but would expand use of the number no further.

The Long provision "goes too far when it would repeal all the protections against widespread use of the SSN which was the focus of Section 7A of the Privacy Act," Percy said on the Senate floor.

"The provisions of the Privacy Law dealing with expanded use of the SSN were under considerable study by several House and Senate committees and by the Department of Health, Education and Welfare.

"Certainly we hear concerns about anti-Washington sentiment and Big Brother. Let us alleviate this concern by not having people feel that in a great big government in a great big country like this all they are is a number identifiable and accessible every which way," Percy said.

Staff members from senators Percy, Goldwater (R-Ariz.) and Ribicoff (D-Conn.) met with Long last week to see if a compromise could be reached, but were unsuccessful.

Long is expected to introduce an amendment to the Percy amendment, which has to be voted on first, but a spokeswoman from Percy's office said she thought "we have enough votes to win."

The tax reform bill was passed last December by the House without the controversial provision.

Rep. Edward I. Koch (D-N.Y.), a sponsor of the Privacy Act, who is also a member of the Privacy Protection Study Commission, is opposed to the Long provision.

"I do not believe the number should be extended except on a case by case – a need-to-use – basis. State taxing authorities have demonstrated a need for it, for example, but I'm against simply allowing it without an agency coming in and demonstrating a need for the number."

Some Papers Not Privileged: IBM

(Continued from Page 1)

they were in other ways connected to the legal effort of the firm and therefore privileged under the idea of attorney-client communications.

Furthermore the firm has claimed it would suffer from the release of the documents because once they were made public they could be used by private companies suing the firm in their cases – even if they are later held to be privileged when and if there is an appeal of the government's case.

Usually a defendant or plaintiff in a case cannot appeal portions of the case while it is still being tried, unless the judge neglects his duties.

Both sides wait until the case is completed and then take the case to higher courts for a decision based upon the entire record in the case.

Both times IBM has taken the issue of privileged documents to a higher court, the higher courts have ruled that IBM will have to wait for its appeal until the case is complete in district court, since they found Edelstein's orders on the documents to be within his discretion.

But this early wrangling over the documents almost certainly signals IBM will make the matter of privileged documents part of its appeal if it receives an adverse ruling from Edelstein in the case.

Consumers Opposed to Bell Bill

(Continued from Page 1)

22]. Since then it has gained support from 129 congressmen and 12 senators, according to The Yankee Group.

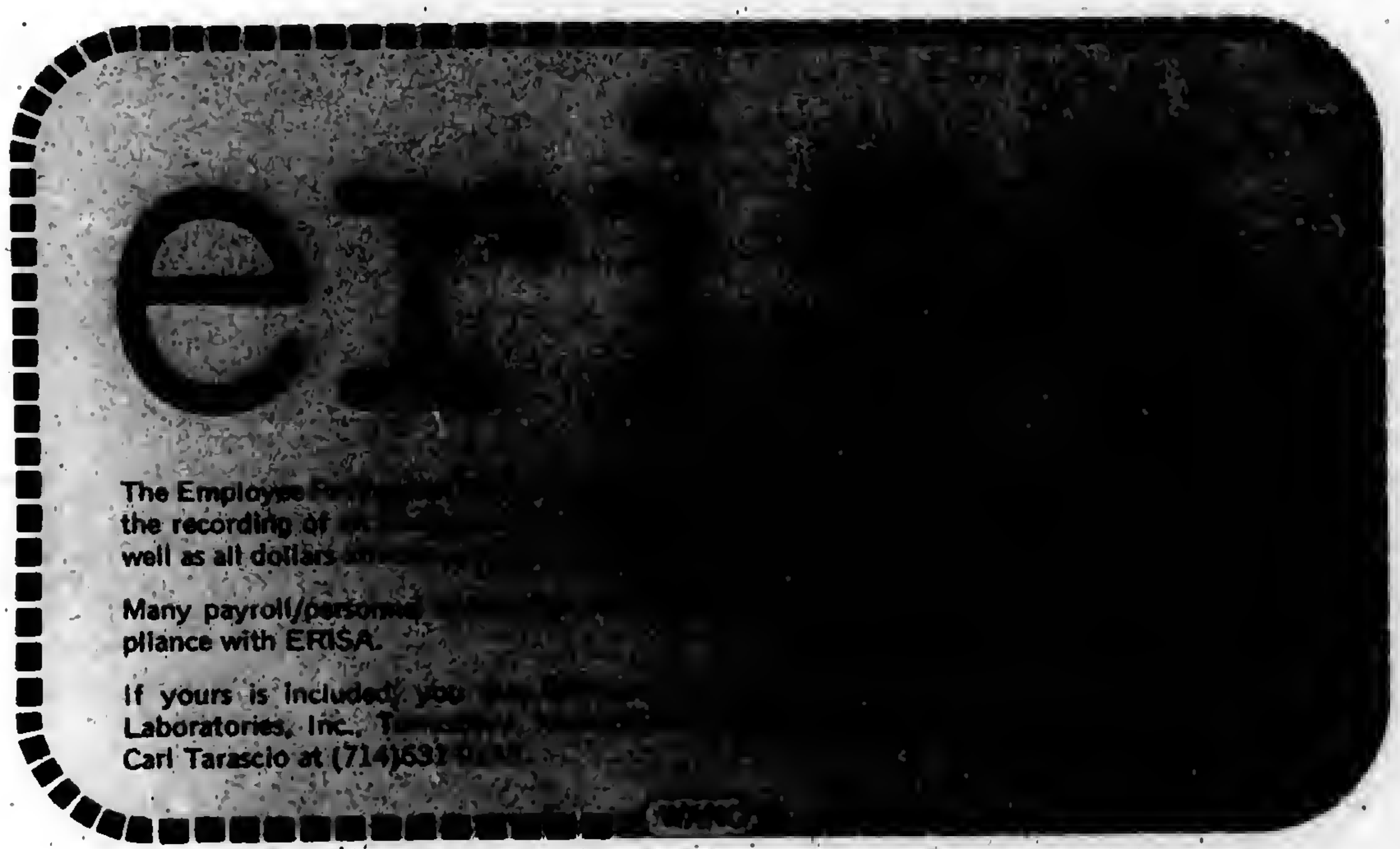
The proposed legislation would effectively eliminate competition authorized by the Federal Communications Commission both in the area of noncarrier equipment connected to the phone network and also for the specialized carriers which compete for customers with the existing carriers.

Commenting on the opposition to the legislation reflected in the survey, a Yankee Group spokesman said: "The American public believes in competition; it has been reared to accept that the very idea of a monopoly is suspect. It wants the right to have and own its own [equipment].

"The consumer finds it hard to be in favor of self-serving legislation," especially in this post-Watergate atmosphere. In spite of the name, 'the Consumer Communications Act,' the American voter will want to make very sure such legislation is really in his, and not Bell's, best interest," the spokesman said.

Hearings on the proposed legislation have been tentatively scheduled for late September by the House Subcommittee on Communications by its chairman, Rept. Lionel Van Deerlin (D-Calif.).

Results of the Consumer Act survey were published in a telecommunications study available from The Yankee Group, Box 43, Cambridge, Mass. 02138.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IBM Reduces Data Supplied To Insurance Companies

ARMONK, N.Y. – Insurance companies can get along with a lot less information on their policyholders than they demand, a three-year privacy program at IBM has found.

IBM's employees are no longer asked to provide their Social Security numbers on insurance claims forms. Instead, they use their employee identification numbers, according to Gloria Poetto, staff information representative.

As a second privacy safeguard, internal claims reviews have been eliminated. Instead, employees transmit claims directly to the insurance carriers, she said.

Third, before IBM releases any medical information about one of its employees to an insurance carrier, the employee is informed and must sign a consent agreement.

After 10 Years of Meetings

Biddle Blames NBS, Ansi for Lack of DP Standards

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Ten years have passed since the Brooks Bill (PL 89-306) was enacted into law, "yet there are still no meaningful hardware and relatively few software standards for DP equipment," A.G.W. Biddle, president of the Computer Industry Association, said here recently.

In testimony before the House Government Operations Committee's Subcommittee on Legislation and National Security, chaired by Jack Brooks (D-Texas), Biddle blamed two organizations: the National Bureau of Standards' Institute for Computer Sciences and Technology (NBS), and the American National Standards Institute (Ansi).

After 10 years of meetings, Ansi's X3T9 I/O channel level interface committee only now has seemed to agree on a standard for interconnecting peripheral devices to a central CPU, he said.

Even if adopted, little standardized equipment is likely to result since compliance by manufacturers and users will be purely voluntary. Further, "equipment interchangeability is deemed by many in our industry to be counter to their corporate self-interest," he charged.

Millions of Dollars Wasted

In the meantime, untold millions of tax dollars have been wasted because of the inability to freely shift peripheral devices within the federal DP inventory, he said.

"Any process which consumes 10 years of effort without reaching agreement on an official standard the industry has long acknowledged as 'de facto' is woefully in need of reform," Biddle said.

Ansi does not write standards, but rather it provides "a vehicle for industry-wide participation in the standard setting process." Thus, if there are recalcitrant members on the standards committee – such as IBM and the other large mainframe manufacturers on the I/O channel level interface committee – the entire standards effort can be thwarted," he said.

"The Brooks Bill assigned NBS a leadership role in development of DP standards in the federal sector, and that it has failed to do," Biddle said.

Had NBS acted, "we would have a standard in the federal inventory and, in all likelihood, adoption of that standard by the states would have followed.

"In time, private-sector DP users would realize they, too, could save money by insisting the next generation of equipment have certain standards," Biddle said in conversation after testifying.

"NBS won't push for I/O standards unless the federal agencies press for them. The agencies are not interested in standards as long as the General Services Administration (GSA) approves their DP requests without standard interfaces, and GSA will not require standards unless NBS so directs," he said.

The Brooks Act is clear economy and efficiency in government DP procurement are its prime objectives, and adopting standard hardware and software interfaces would go further toward meeting the intent of this legislation than all the GSA oversight in Washington, Biddle said.

Standard interfaces would promote a competitive multivendor environment with quantitatively recognizable cost savings to the Federal government, he said.

"The only way you're going to free the DP user is to eliminate the horrendous cost of conversion, and the only way you're going to eliminate the horrendous cost of conversion is standardization of languages, software, I/O channel interfaces, communications standards and protocols," he added.

"GSA knows this. OMB knows this. NBS knows this, but no one seems to be willing to act," he said.

Biddle cited the difficulties encountered with the communications system now contracted to Computer Sciences Corp.'s Infonet Division as a standards problem.

Because of "a lack of standard programs and languages used to operate this system," federal users have found they are "locked into Infonet" and "unable to modify or upgrade this system to meet their communications needs."

The government has requested bids for a communications system that will meet its need for flexibility, but to no avail. The request for bids has been extended for 15 months, yet no one has been willing to bid because the Infonet system is essentially locked in, he said.

"When the government has been able to validate standards, it is often to the credit of an agency other than the National Bureau of Standards.

"The Cobol validation, for example, was first done by the U.S. Navy – not NBS – which only later adopted the Cobol standard through the American National Standards Institute," he said.

A similar process is now taking place with the Fortran validation, he said. "Again, it is the Navy that has been pressing for Fortran validation, with NBS lagging behind."

If GSA "is really earnest about distributive data processing for the Federal government, it strikes one as curious [it] has shown so little concern for stimulating the standards effort," he said.

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3) These books are organized by function. A complete subset of BAL is presented in the first three chapters of the book, and later chapters cover such functions as debugging, table handling, subprogram linkage, and file handling. When material is organized in this way, you learn more quickly because you always see purpose.

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Content

The intent of these books is to develop a basic programming skill in assembler language. As a result, the initial emphasis of each book is on a professional subset of BAL along with the related debugging skills. If you did nothing more than master this material (chapters 1–5), I think you would justify the cost of the book several times over.

Beyond this, table handling, subroutine and subprogram linkage, and sequential and ISAM file handling are given primary emphasis. Since these are common programming functions, this material is valuable background regardless of the language you normally use.

Finally, these books show you how to write macro definitions (great background for working with software packages), how to code bit manipulation and translation routines, how to isolate the fields in free-form input data (a common function in teleprocessing programs), and how to work with direct files. This type of material starts you on your way to the more sophisticated tasks required in a computer installation.

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Memo Shoots Down All Alternatives

FBI Request to End CCH: Plea for Message Switching?

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Some federal officials here and sources on Capitol Hill are wondering if the Federal Bureau of Investigation's (FBI) request to terminate the Computerized Criminal History (CCH) program is actually an indirect plea for message-switching authority.

The FBI's request to terminate the CCH program was made public some weeks ago by the U.S. Attorney General Edward H. Levi in a speech in Houston [CW, June 21], but the 13-page memorandum from FBI Director Clarence Kelley was kept under wraps at that time.

A copy of that document obtained by *Computerworld* has revealed that, although written ostensibly to justify termination of the controversial data bank of computerized criminal records, the memo was loaded to support the opposite conclusion.

Only three possible alternatives to an FBI-run message-switching system were proposed, and each was shot down in a way that makes proceeding with the FBI's proposed switching plan seem the only logical way to go.

Frank Buhl, chief of the FBI's National Crime Information Center (NCIC), which runs the CCH program, denied this conclusion, saying "Director Kelley honestly believes that CCH is a classic example of something that came before its time and should be terminated."

But a number of people close to the controversy disagree with Buhl's claim, drawing evidence from between the lines of the memorandum as well as tactics the FBI has used in the past to obtain the power it has sought.

Basically, critics of the FBI's plan to implement a message-switching system contend that "he who controls message switching controls the criminal information system."

The FBI disagrees with this, maintaining that as long as the criminal records themselves are held by the states and can be accessed only through a federally maintained index and communications system, the system is decentralized.

Such a decentralized system would thus comply with constitutional prohibitions against a national police force.

Possible Alternatives

While Kelley proposed falling back on the FBI's fingerprint identification division to service the states, he pointed out that this division, which dates back to 1924, takes 10 days to three weeks to process and return by mail a criminal history from a state identification bureau of the FBI itself.

And FBI officials have admitted that automated fingerprint identification equipment now in the prototype stage will not be fully operational until the early 1980s, so this is hardly a suggestion that inspires confidence among those whose work it is to fight crime.

However, the only other alternatives to going forward with message switching mentioned in the memo and then discarded were as follows:

- Maintaining the status quo with current operations, plans and policies and continuing to promote state admissions to the NCIC/CCH system pending resolution of the message-switching issue by the Attorney General or the Congress.

Kelley called this alternative "impractical" because the FBI would "surely be brought under more and more criticism and pressure to end" current centralized record collection in Washington.

- Obtaining limited message-switching authority from the Attorney General and moving ahead with current NCIC/CCH plans to "centralize CCH records to the states."

Analysis

- Returning CCH records to the states and seeking "new directions."

The memo said this alternative "at first blush" appears reasonable and it has, in fact, been given the most serious consideration.

However, "years of experience clearly indicate that without massive federal funding and mandatory legislation, few new directions can be transposed from the conceptual to reality," Kelley said.

- Terminating CCH and falling back on the basic resources offered by the FBI identification division.

Among the possibilities ignored in the memo were:

- Turning the message-switching responsibility over to the National Law Enforcement Telecommunications System, a message-switching system currently operated by the state.
- Implementing Nalecom, the highly sophisticated state-managed National Law Enforcement Communications system proposed by the Jet Propulsion Laboratory in a research report funded by the Law Enforcement Assistance Administration (LEAA).
- Hiring a commercial service to operate message switching.

Background of the Memo

As background, the memorandum noted the CCH program was initiated by LEAA in 1969 "pursuant to a grant entitled Project Search."

What the memo did not say, however, is that the original Search proposal never suggested that the FBI operate the switching system and recommended instead that it be run by the state of Michigan, according to William McMahon, a criminal justice consultant who was until recently a telecommunications program director in the Office of Telecommunications Policy.

Kelley also reminded the Attorney General that in 1970 the Office of Management and Budget reviewed the question of who should manage and operate CCH, including a message-switching capability, and recommended the FBI operate it.

That is true; however, at that time, the FBI was competing for CCH against the LEAA, basically a grant-administering organization, and Search, a loose consortium of states that showed no clear indication they could get together and pull it off. The FBI emerged as the winner.

Kelley said further that current NCIC/CCH plans call for a central name index and records of all multistate offenders in Washington, with single-state offender records maintained in the states.

To execute this plan, the FBI requires a message-switching capability, Kelley explained to the Attorney General.

Buttressing its argument for FBI control of a message-switching system still further, the FBI memorandum pointed out that, in the absence of a message-switching capability and its resulting decentralized state CCH operations, the bureau must continue to house all CCH records in Washington – raising the specter of "Big Brother."

Without message switching, Kelley continued, the bureau's position is "untenable." Thus "the only viable alternative is to terminate the NCIC/CCH program."

Among the CCH system's deficiencies cited by Kelley in his request to terminate were that the cost and effort needed to establish and operate the system were grossly underestimated; intergovernmental relations problems were legion; and security issues were not resolved.

Soviet Grand Chess Master Defects at IBM Tournament

AMSTERDAM, The Netherlands – Soviet Grand Chess Master Viktor Korchnoi asked for political asylum here last week while attending an IBM-sponsored chess tournament.

Korchnoi, rated the world's number two chess player, had tied for first place at the tournament.

He was expected to fly back to the Soviet Union July 27, but instead went to the aliens section of Amsterdam police headquarters and asked for asylum.

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990/4 Software Development System. $642 per month.

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Editorials

The Human Element

The recent stories relating to computer usage at the Olympics and in the historic Mars voyage [CW, July 26] illustrated both the strengths and weaknesses of data processing.

Certainly the Olympic Games could have been held without computerized scoring. The Games began long before computers were invented. And despite all their time-saving assistance, a computer used to tally gymnastic scores is still only as efficient as its programmer designed it to be.

The Olympic DP problem was really a miscalculation by judges who never anticipated a perfect four-digit score. But it pointed out why computers will never run our lives. They are only as efficient as we choose to make them. And human thought is still the final control even over "human-like" processors.

On the other hand, the trip to Mars could never have taken place without DP assistance. Certainly it is much more desirable to explore a distant planet with computer-controlled instruments than risk human lives in unknown environments.

The DP navigation and control used to complete the Mars mission is a marvel of the level of sophistication that can be programmed into computer systems when the need arises.

The Olympic and Mars computers had one thing in common. Both were used in their own way to make life easier for the people around them. In one case a minor problem cropped up, but in both instances humans remained in control of the situation. That is exactly as it should be.

An Opportunity in Disguise

The lack of representative items from the computer industry at the DP exhibit in the Smithsonian Institution in Washington, D.C. [CW, July 26] may be an opportunity in disguise.

Certainly those who work within the DP environment have ideas on the significant milestones and developments that helped to shape the industry.

In keeping with other exhibits at the Smithsonian, the articles suggested should be noncommercial wherever possible and should not be oriented toward a single supplier.

But within this objective framework *Computerworld* readers should have some innovative ideas on the articles to be included in an industry exhibit.

Suggestions on DP artifacts should be sent to the CW Editorial Department. Innovative ideas, no matter how unusual, are welcome. The suggestions will be forwarded to the Smithsonian staff, and any assistance on where to locate the items will be welcome.

A stronger DP exhibit accurately portraying the role of computers in society will go a long way toward improved public understanding and acceptance of this relatively new technology.

'. . . And Pending Installation of a Decent State Welfare Edit System, I Bequeath My Regular Medicaid Payment to My Dearly Beloved Whispering Valley Nursing Home.'

Letters to the Editor

Data Transmission Industry Just an 'Unfortunate Casualty'

As a DP professional and only a casual reader of *Computerworld*, I have been surprised at the thrust of editorials and letters concerning AT&T and its lobbying efforts in opposition to recent Federal Communications Commission (FCC) rulings.

The CW editorial staff and CW readers seem to feel AT&T mounted this effort solely to drive the fledgling data transmission companies out of business,

The real impact of freedom to interconnect with the AT&T network comes from the potential for inexpensively produced (by other vendors) telephone sets to be purchased by the general public and business community and freely connected without any AT&T-owned equipment.

This would cause AT&T to both capitalize equipment and charge for the communications service separately from the telephones themselves.

Since AT&T-made telephones are currently owned and capitalized by AT&T and only leased to customers and since AT&T's guaranteed profits are linked directly to invested capital, it is small wonder the potential for replacement of these telephones and inexpensively made alternatives has prompted a massive lobbying effort.

The data communications industry is only a catalyst (and possibly an unfortunate casualty) in this battle.

Bob J. Prince

Arlington, Texas

FBI Hassling IBM?

The text accompanying the May 24 article entitled "Justice Refutes Charge by IBM That Use of FBI Unconstitutional" failed to support the inference of proof that the word "refutes" invoked.

Far from demonstrating that Justice's use of FBI agents in a civil antitrust case was proper, the article left one with the Watergate-like impression that such an abuse was somehow appropriate because its prevalence was an "open secret."

Does it not seem strange that the FBI, which must comply with a fair amount of red tape before it can be brought into the usual criminal case, which even in a kidnapping investigation must wait 24 hours, can nevertheless be drafted into the front lines of a civil conflict at the whim of the attorney who on any particular day happens to be quarterbacking the strategy of the Department of Justice team of trial lawyers?

Aside from the chilling effect on employee morale that the use of battalions of cops-in-lawyers'-clothing may have, and aside from any question of whether it's seemly for putative members of the bar to carry a gun at an interview, the use of FBI agents in civil matters raises the whole issue of whether this can be a proper allocation of government resources.

Can an FBI agent tell the difference between a floppy disk and a tape drive? Could he recognize a DOS program from a sort package? On the contrary, do not the burgeoning number of bank robberies and the snowstorm of interstate heroin traffic cry out for the attention of these skilled public servants?

Has it come to pass that it is now easier for the Department of Justice to hassle IBM than to chase the Mafia?

Howard R. Popper

Berkeley Heights, N.J.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
August 4, 1971

WHITE PLAINS, N.Y. – IBM increased rental prices of its 360 CPUs by about 4% and increased the rental and purchase prices of 370 CPUs and the 2880 block multiplexer channel by about 8%. The price increases partially offset IBM's reduction of peripheral prices last June.

– – –

CAMBRIDGE, Mass. – Harvard University and Massachusetts Institute of Technology (MIT) killed a joint $5 million inquiry into the impact of technology on society.

Eight Years Ago
July 31, 1968

WASHINGTON, D.C. – Joan Van Horn, president of VIP Systems, a computer time-sharing firm located here, charged her one-computer operation was facing extinction because of "unfair competition" by IBM. IBM opened a similar text-editing service using a proprietary software package which it refused to make available to her, she said. IBM offered rates that appeared to be below cost and charged her firm 2-1/2 times as much for her systems as it charged itself for the internal service.

– – –

LOS ANGELES – Computer Sciences Corp. ordered $50 million worth of Univac 1108 computers, one for each of 20 planned regional time-sharing centers in the U.S. and Canada.

Dear Computerworld:

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- ☐ ANGRY
- ☐ PLEASED
- ☐ INVOLVED
- ☐ AWARE
- ☐ CURIOUS
- ☐ EXCITED
- ☐ DEMANDING
- ☐ FURIOUS
- ☐ INFORMED
- ☐ SURPRISED
- ☐ ALL OF THE ABOVE

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The Two-Edged Sword

Pricing has always been one of the factors in marketing that IBM handles best. With the exception of a considerable understatement of the first-shift price of the original (1952) Type 701 – an understatement that was almost certainly due to a Korean War patriotic stance on the part of the Old Man, who had been told there was a need for a very few Defense Calculators to help the military and their biggest contractors – the Gray Giant has been unbelievably skilled at manipulating the rate card. As new competitors announced, waxed, waned and disappeared, and as technology changed the cost of developing and manufacturing the pieces of our weird and wonderful tool, the green-eyeshade boys in Endicott and Poughkeepsie and White Plains and Armonk fiddled and adjusted: lower prices, more throughput, free software, charged systems service, purchase and lease plans, new ways of billing maintenance. The ever-changing tapestry of performance versus price was fascinating.

Especially so to me, of course, as the proud papa of Grosch's Law. Enemies, friends, complete strangers are always telling me – somberly, gleefully, querulously – that somebody or something has finally finished it off. I'm supposed to repel boarders, as it were, and indeed I do on occasion. When there are youngsters around, who deserve and need serious commitment, I often point out that the *total* cost of doing a data processing or scientific computing job is not much affected by using the greatest new microprocessor; that the (hidden) inefficiency of an expensive, enthusiastic, inexperienced engineer writing and debugging his own program, as against a professional banging out a few hundred lines of FORTRAN for his musty but trusty 1108, knocks out the savings (conspicuously displayed) of buying the latest thrill-chip.

But for old-timers, for security analysts, for philosophers of our trade, and especially for those of us with a surviving sense of humor, I go a different route. Grosch's Law is not a great, ponderous discovery, like the law of gravity or the conservation of energy; rather, it relates prices and power and people. What it says is that early in the computer game, the professionals – the users, the programmers, the installation managers – let some of the flood of new technology pour down the penstocks and run the turbines: cheaper orbit computing for NASA, check handling for the Bank of America, paychecks for Appliance Park. And some of the flood they let run over the spillways and off down the canyon: virtual storage, interactive nuttiness, giant operating systems, PL-1, even floating point.

And the marketing experts, at IBM first of course, saw this happening, and realized that throughput was not simply what I had conjectured, a square function of price. What it was was a *controllable* function of price! Within reason, the raw power of the stream of technology could be harnassed, and sold to all but the very most sophisticated customers at a price set by the needs of the producer. Particularly, IBM saw it could introduce great new componentry, fantastic speeds, enormous memories, and yet not actually permit the customers to get such improved performance as to encourage them to ship back equipment. Down inside, a torrent of bits was frothing and churning; at the turbine shaft, a few more horsepower were grudgingly released.

It has been a dangerous strategy. On the one hand, a really courageous competitor might start selling raw power; in fact, the Fairchilds and the Intels and the National Semis do so. And on the other hand, grim old Restraint Of Trade lowers from the halls of FTC and the Department of Justice. But for twenty years it has worked.

Now we see a new test. Heartened by the diminishing danger from the antitrust trials, wary of the Japanese threat and the surprising vigor of Burroughs and Univac and DEC, IBM has put a notch in my curve: more bang for, not as usual a few more, but in this case for a few *less*, bucks. The 138 and 148 are to be viewed, it seems to me, not as technical advances, in spite of their LSI-ness, but as adventures in pricing.

Dangerous! Technical advances the antitrust boys can not yet challenge. But trick pricing is *verboten*. Yet look at the problem; IBM is near the limits of the 360/370 architecture. It cannot usefully play an Amdahl; the scale of the IBM game is too huge. It needs time to get minimally workable software for the neo-FS generation, let alone the gummed-up, over-elaborated, security-layered, super-virtual mushware needed for 1978 or 1979. The courts, the bureaucrats are weak; IBM pricing is creative; the competition is docile.

Sharp is the sword: pugnacious pricing. Double-edged is the blade. It will be a fascinating year!

Herb Grosch

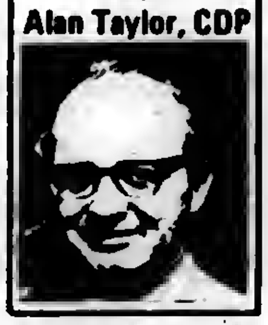
Form Aids Documentation of Decision-Making Process

Computer system documentation has traditionally been regarded as being used to show how a system is working the way it does. This, however, is in many ways only of subsidiary interest.

The Taylor Report

By

Alan Taylor, CDP



How a system actually is working is simply a technically interesting factor. Why it was designed to work that way and whether it was so intended to work that way is often the key question to be answered after the event.

Neither of these questions are answered by the traditional documentation showing the flowchart, files, timings, etc.

Jerry Alders, a Dallas programmer, has come up with a systematic way of adding these decision points to the documentation, without taking up too much room or requiring anyone to wade through mountains of narrative.

For instance, a particular function, such as a table lookup, can be handled by generalized programs or by a tailor-made program. While these two alternatives need noting, the differences between the two techniques are only a part of the necessary considerations.

More detail is required before decisions once made can be reviewed at a later time. Even the degree of tailoring is a variable.

Three Change Levels

In Alders' suggested alternative documentation, illustrated in the figure, space is allocated for three levels of change for any particular alternative. Sometimes, of course, a particular alternative is available only as a major change. Here, only the existence of the feature needs inserting.

While the form is basically designed to handle a single alternative broken down into parts and analyzed, its layout with a number of divisions permits two or three simple alternatives to be illustrated upon a single form.

This is particularly useful when there is some overriding advantage or controlling factor involved in the choice – such as one way being the only way the budget can be maintained or the only way the schedule can be kept.

Under these circumstances, only two alternatives need be illustrated – one the way that would be used if the constraint did not exist and one the way that is in fact forced into existence purely through strength of the budget, schedule or whatever the requirement is.

Impact and Benefits

The rest of the form is taken up with a joint impact and benefit analysis. Here a number of standard considerations are taken such as the training question, developmental time, etc. Unlike the first parts of the form, these should be responded to individually. Not-applicable, or no-change entries are allowable, but consideration should be given to each area.

This way there can later be no question as to whether the additional operational cost involved, say, in taking some quick-and-dirty approach was appreciated at the time the decision was made.

'X' Marks the Spot

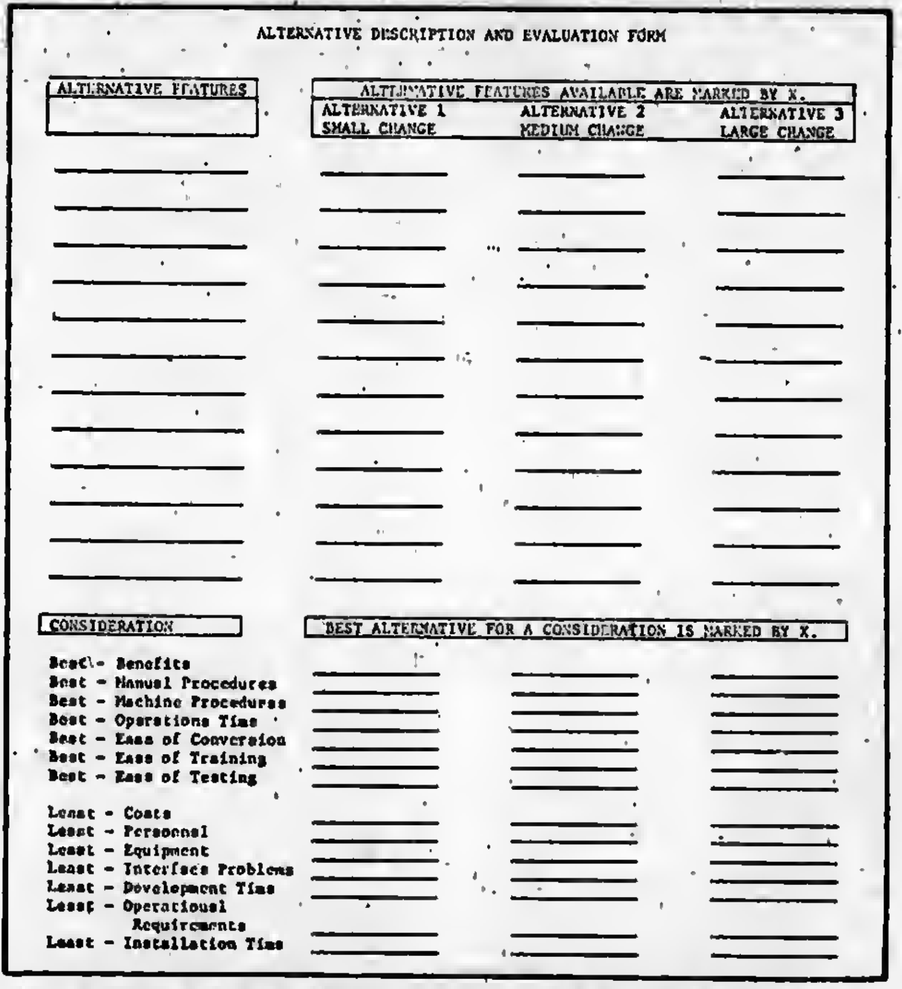
To make the system as unburdensome as possible, all that need be entered are Xs indicating the most desirable result.

A lot of 'X' on the finally approved decision would be nice, but is not normally realistic. An approach that minimizes training, testing and operational requirements is most unlikely to also minimize developmental time and costs. Normally, a trade-off situation is quickly illustrated, and the final decision can be annotated on the form itself if denied.

There is, of course, the question of technical errors. Sometimes an approach is expected to be low cost, but turns out to be high cost. Using the form as a part of the documentation permits this case, where the costs have resulted from some technical oversight or error, to be distinguished from the other case where the costs were in fact foreseen, but the decision to incur them was taken with accurate and appropriate input.

The Alders form permits, and in fact demands, technical reporting in simple, easy-to-understand manner, one capable of unambiguous later review.

Without the use of such a form, it is generally found either that the documentation is missing entirely or that it is contained in memos, formal reports, etc. (These themselves are often contradictory.) This method, which only takes about a minute per form to fill out, provides everyone from the coder to the vice-president with the capability of documenting decisions and the reasons quickly and accurately, yet ready for integration with the rest of the system documentation.



ALTERNATIVE DESCRIPTION AND EVALUATION FORM

ALTERNATIVE FEATURES	ALTERNATIVE FEATURES AVAILABLE ARE MARKED BY X.		
	ALTERNATIVE 1 SMALL CHANGE	ALTERNATIVE 2 MEDIUM CHANGE	ALTERNATIVE 3 LARGE CHANGE

CONSIDERATION	BEST ALTERNATIVE FOR A CONSIDERATION IS MARKED BY X.		
Best - Benefits			
Best - Manual Procedures			
Best - Machine Procedures			
Best - Operations Time			
Best - Ease of Conversion			
Best - Ease of Training			
Best - Ease of Testing			
Least - Costs			
Least - Personnel			
Least - Equipment			
Least - Interface Problems			
Least - Development Time			
Least - Operational Requirements			
Least - Installation Time			

The form shows a method of documenting the various considerations used in evaluating a single decision during systems analysis.

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Reader Commentary

To Protect Developer's Ideas

Nondisclosure Agreement Crucial for Software Sellers

By Charles A. Gravitt

Special to Computerworld

Thinking about selling some of the computer software you developed? Many private companies and some governmental agencies are doing this on a selective basis to recoup some of the high cost of developing it.

The process of making the business decision of whether to sell your software presents a plethora of issues to be considered. But once your company has decided to sell the software, arrived at a price which will produce a reasonable return on investment and resolved all of the pros and cons recognized, there is still time to think about protecting your "bread and butter" software before disclosing it.

Whether you only passively offer software for sale and make few disclosures or engage in an ambitious marketing effort with numerous disclosures, you need to take positive action to preserve your rights in the software.

To not do so may be a grievous error. You could not only lose windfall income, but an invaluable competitive advantage as well.

The existing patent and copyright laws and the interpretation of them do not offer the software developer a great deal of practical protection.

If the choice is made to seek a patent, the software creator risks losing his trade secret protection because he must disclose the code. The patent application process is relatively expensive, and a patent award for computer software has been seldom granted.

Patent applications may, at the present time, be rejected by the U.S. Patent and Trademark Office when it is determined the novelty of the invention is related to the computer aspect of the system. In the Johnston case, the U.S. Supreme Court recently affirmed the denial of a computer software patent application because the solution was obvious.

Registering computer software for copyright likewise involves a disclosure of the ideas and methods employed in the code and probably the code itself.

However, currently the U.S. Copyright Office will probably reject registration of computer software for copyright protection.

Pending copyright legislation may incorporate a more liberal interpretation of the requirements for publication under existing laws. If enacted, this new legislation would include restricted licensing or leasing of software to a limited group of customers.

In addition, new procedures or regulations embraced under this pending legislation would allow public disclosure of only a brief description of the computer software instead of the full and complete text now required. While the deposit of the complete description would still be required, public inspection – and thus public disclosure – would be limited to the brief description provided for that purpose.

'Common Law' Copyright

Until patent or copyright protection for software becomes ironclad under case law or further federal legislation, "common law" copyright and trade secret legislation are the software developer's best allies.

To take advantage of common law copyright without registering any material, listings of program code, procedures and related documentation should all be marked with a warning such as: "This material is the exclusive confidential property of XYZ Co. All rights, including copyrights and patent rights, are reserved by XYZ Co."

This warning will put anyone who reads your documents on notice of your belief in your rights and your intention to enforce them to the extent possible.

Generally, any procedure, method or other device which gives you an advantage over your competitors can be considered a trade secret.

However, in order to retain any rights under existing laws, your company must be careful not to inadvertently or intentionally disclose your trade secrets; such disclosure will likely nullify any protection you might ever have had.

Since computer software must be disclosed, at least in part, in order to make a sale, a carefully prepared nondisclosure agreement between you and the prospective customer should be signed before any specifications beyond the general sales brochure are disclosed.

In my opinion, a comprehensive nondisclosure agreement is an indispensable element in dealing with prospective customers for sale of your software. Without it, there is no private obligation to assist in protecting your property, and you are left to rely on general principles for relief should damage occur, particularly if a sale is not consummated.

The execution of this agreement will place no undue burden on the reviewer and is merely an extension of the good business practice of dealing at arm's length. The reviewer will appreciate your concern for the software and readily see the need for the agreement.

As an aside, such an agreement has certain intrinsic value to show your software is worth protecting – and may even enhance its marketability.

The Agreement Itself

All of the general requirements for completeness and accuracy that apply to any business contract are applicable to a comprehensive nondisclosure agreement. If the contract doesn't say what the parties' responsibilities and liabilities are, those items omitted will be difficult, if not impossible, to enforce.

Several critical and salient points of a typical nondisclosure agreement will be covered here. Many of the points are quite standard and will be mentioned with brevity. But one should not let this briefness obscure the importance of these items – each and every clause is absolutely necessary for your protection.

Let me preface these with a word of caution: Every contractual situation is unique with its own special problems and, at some stage of development, should be dealt with in isolation from the general case.

Competent legal counsel should be sought before finalizing the contract. It cannot be stressed enough that a complete nondisclosure agreement executed now could remove a number of lively issues from debate later and possibly avoid damage and lengthy litigation.

The contract should detail the parties to the contract together with their principal business addresses. If a party is a corporation, the state of incorporation should be included. In order to be valid, the contract should be signed only by a duly authorized officer of the corporation.

Consideration is an essential element in any valid contract. One party does one thing in consideration of the other party doing something else. If there is no consideration, the contract may be null and void.

The company disclosing the computer software should state what specifically is being sent for review; it thus is covered by the nondisclosure contract. The material can be itemized in an exhibit to the contract; verbal disclosures also need to be brought within the realm of material being protected.

The agreement should state a definite period during which the material may be kept and studied; a statement should note that the material is being made available for temporary use and only for review purposes.

Prohibition against the reviewer's disclosure of the material, in whole or in part, to any other person, firm, corporation or governmental entity should be spelled out clearly. Permission to allow secondary disclosure to affilates or wholly owned subsidiaries could, however, be given at the option of the material owner.

The reviewer should agree it will not assign, sell, license, franchise or otherwise convey the covered material to any third parties or to unauthorized personnel.

The reviewing party should be obligated to make its employees and agents aware of the terms of the nondisclosure agreement, agree on behalf of everyone who will have access to the material that it is the owner's trade secret and proprietary in nature (whether any portion is validly patented or copyrighted) and agree to be responsible for and pay compensatory damages in case of unauthorized disclosure.

There are severe penalties for stealing trade secrets under existing laws, so the exposure to wrongful conversion to own use is somewhat reduced.

Once the review period has expired, it should be mandatory for the reviewer to warrant in writing that the material and all copies of it have been returned to the owner or destroyed and that the reviewer has no material remaining in his possession.

Another technical drafting consideration is establishing the situs of the contract, that is, the state under whose laws

(Continued on Page 12)

Letters to the Editor

Serious Omission

I was quite pleased to read the article, "Guitar Maker Plucks Own System From OEMs' Shelves" [CW, April 5], about our company.

I must, however, point out one serious omission in regard to the system configuration. Perhaps the most important component is the Diablo 44 disk drive and controller, which was purchased from System Industries of Sunnyvale, Calif.

It should also be noted the disk Iris operating system, developed by Educational Data Systems, was purchased from System Industries. This was part of the disk system package and, frankly, one of the best ways to guarantee system operation.

By purchasing software together with the disk, one supplier is really responsible for correct operation of all units, which is quite often the failing of mixed vendor systems.

John C. Hall
DP Manager

Rickenbacker Co.
Santa Ana, Calif.

why lease alpha when tso is free?

Responsiveness, ease-of-use, minimal system overhead, flexibility, reliability, user satisfaction, lower total cost...

[illegible]

COMNET

Sometimes every performance has to be a perfect performance.

You can't afford anything less with high-density recording.

The reasons for using 6250 CPI recording — like increased packing density and faster data transfer rates — are good ones.

But you need to recognize certain complexities inherent in these systems. You should know that because of masking by the GCR format, normal system interrogation doesn't give you a complete error listing. Ask your Graham product technology man for details.

Also, at 6250 CPI, debris sensitivity is increased tremendously. That's why, instead of ordinary computer tape, you need Epoch 4. It's certified error-free, and it resists debris-creating stresses longer than any other tape.

Epoch 4. The perfect solution to high-density recording problems.

GRAHAM MAGNETICS
Graham, Texas 76046

Nondisclosure Agreements Can Protect Software

(Continued from Page 10)

the contract will be construed. If you want it to be your principal place of business, the contract should say so.

Special Problems

There are special problems associated with international contracts. Also, some business transactions with certain foreign powers could require prior approval by the U.S. government.

You should obtain counsel before entering into any exploratory negotiations or agreements with an international party.

It is a good idea to have the nondisclosure covenants survive any termination of the agreement for three to five years if this can be negotiated. This will allow time to discover any unauthorized disclosures and determine the extent of damages.

It also places a burden on the reviewer to be diligent in following up with his employees who might innocently believe there is no longer any reason to protect your secrets after the material has been returned.

The owner should be entitled to an injunction restraining the reviewer from committing a breach or threatened breach of the nondisclosure agreement, without a proof or showing by the owner of any actual damages. In order for this clause to be effective, it must be in the agreement.

Further clauses can be written into the agreement to provide for a wide variety of considerations or contingencies such as shipping charges, settlement of disputes by arbitration and obligating a party to make any necessary filings with government agencies. These should be incorporated into the agreement as the situation demands or your company deems necessary.

Each Case Different

The nondisclosure agreement suggested here and the reasons for it cover the general case.

Your own unique situation may dictate further protection or an alternative method. Examine your case carefully before deciding what to do. If you can't do this for yourself, secure competent advice.

One of the gravest pitfalls that can be encountered is to impulsively assume the general case applies in your situation. As surely as you do this, you will find that the characteristics assumed in the general case happen not to be those which apply to your special case.

I believe the nondisclosure agreement is essential to presale protection for your software when more is to be disclosed than general sales information and has proven to have a calculable return on investment.

Gravitt, an attorney, is general manager of computer planning at a large U.S. airline.

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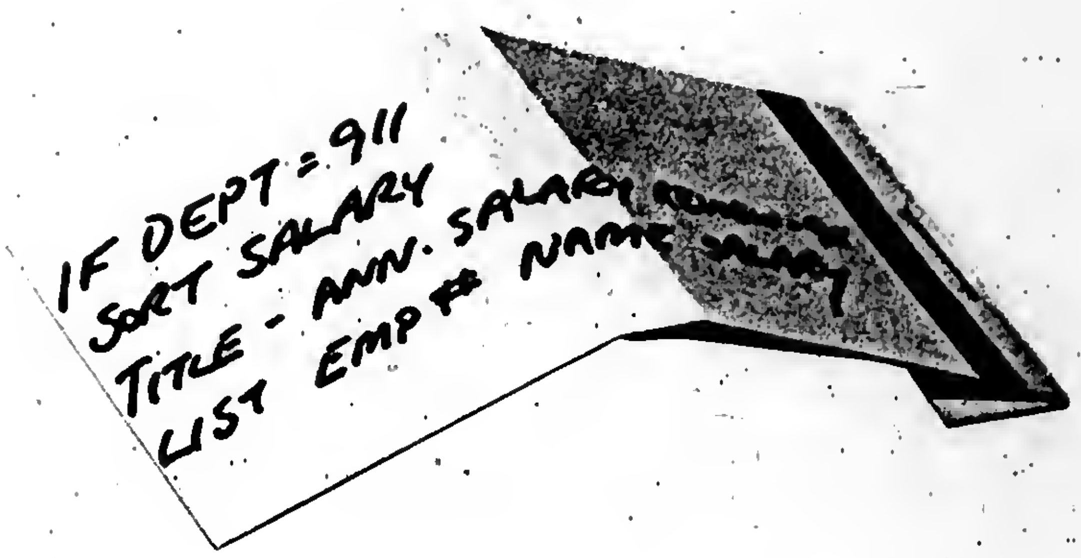

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Customized System Solves Problems for Novice User

GAINESVILLE, Ga. – Keeping up with the cost of goods sold and profit margins "can really be a problem when you're talking about 8,000 different parts stored in three separate locations and coming from 30 or 40 different vendors," according to Ted Ross, president of Ross Equipment, Inc.

That was the kind of problem that made Ross – a dealer in heavy logging equipment – decide to upgrade from the magnetic ledger card system he had used for about two years.

"We just couldn't get enough work out of the old system," he said.

But Ross didn't want to become a computer expert, so he turned to a systems house to find a solution to his problem.

Though Ross and Computer Software, Inc. (CSI) of Atlanta looked at several hardware configurations, each vendor knew in advance CSI would be providing the system design and the application software.

The application software would consist of invoicing, inventory control, accounts receivable, accounts payable, general ledger with financial statements and payroll.

CSI developed a system to provide real-time inquiry into all master and transaction files as well as on-demand reporting of receivables, back orders, open purchase orders, open payables, general ledger activity and, of course, inventory.

All report programs were designed so they can be run in background mode, leaving the terminals free for data entry and inquiry.

The inventory control system in effect maintains each of the product lines as a separate inventory for reporting purposes. The system has the ability to print the reports in the same sequence as the vendor's price list, regardless of the part number used for billing and inquiry.

Inventory reporting is on a weekly and monthly basis. The weekly inventory report shows on-hand and on-order quantities at each location; the weekly reorder report shows items below minimum in each location and whether stock can be transferred to fill in shortages.

Major Problem Solved

The major problem of inventory cost was solved by an open purchase order system which updates inventory costs by order cost and later adjusts cost it the billed cost is different.

Another area of great concern to Ross was the total profit picture on his heavy equipment sales. The CSI system generates a report detailing all presales preparation cost and postsales maintenance costs for a particular piece of heavy equipment.

Before the system was installed, all billing and receiving were held up until the general ledger could be closed out. At times it would take from the 25th of one month until the 20th of the next to close out the previous month.

The CSI system was designed to allow Ross to go ahead with the next month's billing and other work and close out the general ledger when all the figures are in, no matter how long it takes.

Because of the structure of the company, Ross requires in-depth financial reporting. He has 800 general ledger accounts which generate 32 separate financial statements by department within branch and various levels of consolidation. Once all data has been entered, the entire general ledger period-end closing is performed automatically.

For various reasons, GSI and Ross finally chose a Nixdorf 8870, including two CRTs, 10M bytes of disk storage and a 165 char./sec printer. The $45,000 system is located here in Gainesville and information flows to and from the other branches in the form of source documents and weekly reports.

Both the hardware and the software are capable of handling remote terminals when they become economically feasible in the remote branches, Ross noted. The programs are written in Business Basic and are totally interactive, according to CSI.

Installation was completed last March and went "very, very smoothly," according to Ross, even though the mainframe was one of the first Nixdorf 8870s in this country.

"We had our doubts about an uproven machine, but the combination of hardware support from Nixdorf and software support from CSI has made us real believers," Ross said.

"While the software was only a fraction of the hardware cost, we knew that it was the programming that would make or break the system," he concluded.

'Production IV' Features Back Immediate, Long-Range Planning

WOODLAND HILLS, Calif. – Features added to Production IV software from Informatics, Inc. support long-range planning on the one hand and immediate assembly decisions on the other, according to the firm.

Production IV was described as a family of modules designed for manufacturing planning and control that provides the facilities with which a company using an IBM 360/370 can reach the optimum goals of reduced inventory, increased productivity and improved customer service.

The Master Schedule Maintenance (MSM) feature has been added to the software to show management the relationships between marketing requirements, a proposed master schedule and projected finished goods inventories, Informatics said.

The second feature added, Kit Marshalling (KM), checks the availability of all components before the release of assembly orders to the shop, a spokesman added.

KM performs a "paper fill" of selected orders by allocating materials on a combination of due dates determined by the Material Requirements Planning (MRP) module, with options for manual override.

Options are also provided for calculating reduced order quantities based on critical components, the spokesman noted.

MSM is said to be especially useful for high-volume or build-to-stock manufacturers. As new market forecasts are entered, projected on-hand balances are recalculated and displayed using the current production program, according to the spokesman.

Although designed to be used with Production IV, both MSM and KM can be purchased separately.

Written in Cobol to run under DOS or OS, MSM costs $3,500 while KM costs $5,000. Production IV with MRP – "which most installations have" – runs in 128K and costs $50,000 to $110,000, depending on other options selected, the spokesman added from 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

'RACF' Tightens OS/VS Security

WHITE PLAINS, N.Y. – The Resource Access Control Facility (RACF) software announced recently by IBM allows installations under OS/MVS to limit users' access to only those areas in the system required to do their jobs, a spokesman said.

Designed for use in batch mode or with the Time Sharing Option, RACF provides control by identifying and verifying users of the system, authorizing and logging access to information on disk storage devices and logging detected unauthorized attempts to use the system, he added.

To put this program product to work, a center's DP management establishes program profiles and access authorization levels for individual users, groups of users and specific information that requires additional security protection, he said.

Users identify themselves when they attempt to enter the system. Even if RACF verifies their identities, users can access only the data for which they are authorized and that is managed completely by the previously defined RACF profile.

Unauthorized access attempts can be routed to a security console for immediate action. In any case, an audit trail of access information, including the authorized attempts, can be generated for later analysis, IBM said.

The software can be used under OS/VS2 Release 3.7. It has no special hardware requirements other than those associated with the MVS system control programming. RACF requires approximately 73K bytes of virtual storage.

Scheduled for first shipment this fall, the package will be available under license for $875/mo.

VCI Systems Get CICS Accounting

CHERRY HILL, N.J. – Detailed transaction-level accounting on a daily basis is said to be available to users of IBM's Customer Information Control System (CICS) through the facilities of a CICS Input Subsystem introduced by Value Computing, Inc. (VCI) for its System I and Comput-a-Charge packages.

While the daily figures allow billing for current use, year-to-date figures – also accumulated and reported by the VCI software – should provide users with the perspective needed to stay within budget or to modify budget figures if they prove to be unrealistic, the vendor said.

Terminal and line usage, still another range of information available with the CICS Input Subsystem, is shown on weekly, monthly, quarterly and annual bases. This can be a "great aid" to an installation optimizing its terminal network, VCI added.

Applicable to CICS operations under DOS, OS or the VS equivalent, the subsystem interfaces with IBM's Field Developed Programs (FDP), CICS Analyzer Performance Analyzer and – for CICS/VS – Analyzer II. No changes were made in either CICS or the operating systems, according to VCI.

The VCI enhancement package is available to existing System 1 or Comput-a-Charge sites for $2,150. The fee for others is $2,500.

System 1 ranges from $4,500 to $5,500, while Comput-a-Charge costs $6,800 to $8,000. IBM's FDPs costs $70/mo for 12 months.

VCI is at 300 VCI Building, W. Marlton Pike, Cherry Hill, N.J. 08075.

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T/S Net Adds AR/70

MISSISSAUGA, Ont. – Accounts receivable processing has been added to the library of programs available through the remote-computing network of Canada Systems Group (CSG).

Other applications in the library include accounts payable, financial planning, general ledger, payroll and inventory control, according to a spokesman.

The receivables capabilities implemented by CSG are those of the AR/70 package developed by Computer Systems & Education Corp. of Hartford, Conn., and now marketed by Management Science America of Atlanta.

AR/70 supports both open-item and balance-forward accounting and several methods of cash removal, the company said.

Proper handling of repeating transactions and revolving charges, monitoring of unearned discounts and past-due accounts and production of such miscellaneous items as dunning notices and mailing labels are also part of the AR/70 approach.

Based on a pair of IBM 370/168s at a data center here, CSG service is available coast-to-coast through the facilities of the Bell Canada Data Route. Users in or near cities served by Data Route can reach CSG directly; others face toll charges to the nearest entry point, CSG said.

The accounts receivable support is available for an installation fee of $1,000 which covers user education, installation aid and royalty-loaded service charges for system resources actually used. There is no minimum monthly fee, the spokesman added from 2599 Speakman Drive, Mississauga, Ont. L5K 1B1, Canada.

Univac Extends 'Cade' Software

BLUE BELL, Pa. – A software enhancement which extends the data entry capabilities of its 1900 Computer Assisted Data Entry (Cade) system has been added by Univac.

The enhancement, known as File Inquiry Technique (FIT), also provides multiple access to large data files and enables user departments to access related files from local keystations, the company said.

16K Bytes Required

Other features of FIT include Cobol program access to batches and files; added Cobol language capabilities said to minimize memory utilization, increase disk storage efficiency and improve programming flexibility; supervisor file management facilties; and operator mode for file inquiry and update.

FIT requires a minimum of 16K bytes storage, depending on the number of active keyboard, record size and associated application packages.

Univac has also added 8.8M-byte disk units to 1900 Cade to provide a total of 35.2M bytes on-line. Prices for the disk units vary from $315- to $487/mo, including maintenance.

For systems with main memories greater than 64K each 8K module costs $96/mo.

Delivery of both FIT and the larger capacity disk units is planned for January.

Inexpensive 'Tics' Eyes Tape Libraries

COLUMBUS, Ohio – Working with a disk-based file built from operator-provided data, the Tape Inventory Control System (Tics) from Applied Financial Technology, Inc. (Aftek) manages magnetic tape libraries for users under DOS.

Tics was designed to handle production, test and scratch tapes separately. It lists tapes to be scratched and also monitors the number of times specified tapes have been used.

Handling of production tapes includes generation shifting and tentative assignment of expired tapes to the scratch pool. Once that assignment has been confirmed by the librarian, the tapes are available for other use, Aftek noted.

The integrity of test files is maintained, a spokesman added, by assigning each one a unique owner code and expiration date.

Written in IBM Assembler, Tics runs under DOS on any IBM 360/370 that supports direct access storage devices. The internal logic of the program takes less space than the IBM sort it invokes to organize the reports, Aftek said.

The package costs $2,000 and can be ordered from 42 E. Gay St., Columbus, Ohio 43215.

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Cullinane Information System 1:00-3:00 p.m.

An introduction to the direction the Cullinane Corporation is taking in providing their clients with a complete information system. Cullinane developments include a Data Dictionary, The SHADOW II Communications Monitor, On-Line Query System, Distributed Data Processing and Mini-Computer versions of IDMS. Also covered will be the CULPRIT Retrieval System and user department versions such as EDP-AUDITOR and EEO-AFFIRMATIVE ACTION REPORTER.

Social 3:00-4:00 p.m.

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Seminar Leaders

Robert J. Davis — Mr. Davis is Regional Marketing Manager for Database Systems. He has extensive experience with most aspects of database system design and usage, and has held key positions with both IBM and CINCOM. He is responsible for the marketing of database products in the U.S. and Canada, analyzing competitive products, and finding new markets for database technology. Mr. Davis holds a B.S. degree from the University of Akron.

William R. Casey — Mr. Casey is Vice President responsible for customer education. His responsibilities have included technical development work on the IDMS database management and CULPRIT retrieval systems, customer support, documentation, and consulting functions as well as database training. He is the author of several articles on database and has been a lecturer on database systems for both Advanced Management Research and Management Education Corporation seminars.

James G. Blake — Mr. Blake is National Marketing Manager for the Cullinane Corporation having responsibility for the CULPRIT family of products including EDP-AUDITOR and EEO-AFFIRMATIVE ACTION REPORTER. Prior to joining Cullinane Corporation, Mr. Blake held several key positions with IBM Corporation. His responsibilities at IBM centered on small and medium-sized computer configurations, giving him an in-depth exposure to a wide range of commercial applications.

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Proposed Programming Method Assumes Goals More Important Than Structures

By Richard J. Cichelli
And Martha J. Cichelli
Special to Computerworld

Concepts and Techniques

The current commotion over structured programming (SP) seems, at best, overdone.

SP is frequently presented as a set of coding rules, most of which begin with the word "don't." The SP messiahs insult what were thought to be well-designed programs with finger-painting "GOTOs! Tsk, tsk."

If there is practical validity in the SP philosophy, its rules must be reformulated positively in terms of "dos" satisfying the request, "Show me how to do it better."

We propose "goal-directed programming" (GDP) as a positive, consistent, integrated design philosophy incorporating both SP and top-down design principles. For the experienced programmer it is a guide to proper design; for those who have never written a line of code, it is a way to understand and participate in program design.

The programmer's job is to design and specify an algorithm to accomplish a task: The resultant algorithm will be composed of primitive operations on data called function code (e.g., MOVEs in Cobol, assignment statements in Fortran) and control code which determines whether, or how many times, function code is executed (IFs, PERFORMs, DO-loops, GOTOs, etc.)

SP theory tells us the control code should be formulated from D-structures (Dijkstra's sequence, if-then-else and while-do). Assume we have a language with these and a few extensions (case, repeat-until, for, etc.).

Are they sufficient for good programming? If so, how do we get from the problem specification to a proper program solution?

We need a problem-solving technique which transforms problem specifications into program code.

An Example

Let us say we wish to copy a "sentence" or sequence of characters ending with a period. A structured program in a PL/Esperanto (with D-structures) to do this simple task might look like:

```
REPEAT
   CALL READCH(CHAR)
   CALL WRITECH(CHAR)
UNTIL (CHAR = PERIOD)
```

How do we get from the goal "copy a sentence" to the code? Since we know a sentence is a sequence of items, we need repetition to process the items. Every iteration needs a termination. (Otherwise we loop forever!)

The design process in outline is:

Goal: Copy a sentence.

Assertion: When the sentence has been copied, the period will have been processed.

Condition: (CHAR = PERIOD).

From the goal we derive an assertion that is affirmed when the goal is achieved. From the assertion we derive a logical condition that is true when the assertion becomes true.

This logical condition forms the termination condition of our iteration code. At this point in the design the program would look like this:

```
REPEAT
   copy a character
UNTIL (CHAR = PERIOD)
```

"Copy a character" can then be elaborated in place into the more primitive:

```
CALL READCH(CHAR)
CALL WRITECH(CHAR)
```

How does GDP lead to the top-down design of structured programs? At any level of problem decomposition certain subproblems may be solved by the available primitives while others must be further factored into subgoals and their corresponding subproblems.

GDP design is an elaboration of the problem-solving process; it tends to be top-down because human problem solving tends to be top-down.

Since the top-level code is user problem-oriented, user participation during the crucial early stages of system design is facilitated. Design and coding take place simultaneously. Traditional flowcharts, at best a poor design tool, can be eliminated.

GDP develops with an intuitive and natural structuring. Each goal is expanded in place. Since no goal is satisfied by "going" somewhere else, there is no temptation to create spaghetti-like control code.

Control code is separated both logically and syntactically from function code; it is created immediately from the logical conditions derived from the goals and is coded before the function code implementing the goals.

Of course, the function code may itself contain control code. Proper nesting of control structures is ensured by the top-down order of the design-coding process.

Data Structure Design

What about the design of data structures? For every goal-problem we can apply the goal-assertion-condition transformation.

The concepts of goal-directed programming (GDP) presented here will be illustrated in the next article by the Cichellis, using Edgar Dijkstra's "silly program": given two routines, READCH and WRITECH, and an input sentence, copy the sentence so that extra blanks are eliminated and every other word is written backwards.

If the overall problem statement is our first goal, these transformations will lead directly to a top-down design of the program. The same top-down process should be applied to designing a problem's data structures.

Proceeding from the most general statement of the problem leads directly to treating the most general or inclusive data structures first. To process large compound data structures we decompose them into smaller components and then process the components.

Processing a mailing list file, for example, requires decomposition of the file into records and the records into name and address lines, etc.

There is a direct correspondence between D-structures and data structures. Records are made up of sequences of elementary data items and of structures. These structures may contain iterated parts or alternative component parts. Data structures are most appropriately processed by their corresponding D-structure.

Code sequences or blocks process aggregates of items of different types; WHILE and REPEAT loops process sequences of items of the same type; and CASE and IF selectors process alternative parts.

Richard Cichella is research manager of computer applications at American Newspaper Publishers Association/Research Institute in Easton, Pa.; Martha Cichelli is a partner in Software Consulting Services, Allentown, Pa.

Assembler Users 4K On CA Millicomputer

IRVINE, Calif. – Computer Automation, Inc. (CA) has introduced an Assembly language package designed to function in 4K 16-bit words with the company's LSI-3/05 Millicomputers.

The Omega 3/05 is an assembler/editor combining the features of a conversational source program editor and a two-pass assembler, which enables users to perform interactive editing via a teletypewriter keyboard, CA said.

In-Memory Work

The software provides in-memory program assembly and maintenance; both updated source programs and object code can be punched onto paper tape, according to the vendor.

The software is available for $140 from CA at 18651 Von Karman, Irvine, Calif. 92713.

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Definition of DTE Interface Crucial

Adoption of X-25 Could Signal New Era of Problems

By Louis Pouzin
Special to Computerworld

A major benefit of the work to produce a single standard data link control procedure is the potential ability to exchange data between equipment of mixed origins.

It is fundamental that such a major achievement be maintained and expanded when new communications media become available.

The standardization of Higher Level Data Link Control (HDLC) will foster the development of communication products Implementing transmission procedures in hardware or firmware. This evolution will bring substantial savings in production and maintenance costs and will reinforce stable HDLC codes of practices.

These considerations lead to a policy of strict conformity with the HDLC standard whenever it is applicable without penalty in cost or efficiency.

The data terminal equipment (DTE) interface will gradually become a part of the hardware or firmware. Thus it is essential the DTE interface remain unchanged. Interface variations depending on national options or differences in communication media would be detrimental to the user interest.

A DTE equipped with an HDLC interface should require no modification when it is inserted in different configurations (point-to-point, multipoint) or connected through different communication media (permanent or switched, analog or digital, half- or full-duplex).

A violation of that requirement would lead to a growing number of specialized DTE interfaces and work against standardization.

The HDLC procedure has been designed to operate on a variety of communication media capable of transmitting frames. Transit delay, bit rate and error rate may vary. The span of normal variations is covered by a proper adjustment of the HDLC procedure parameters.

However, the communication medium must meet a particular requirement to deliver frames in sequence. In other words, it should behave as a circuit.

Circuits may be implemented with many different techniques: permanent, switched, wires, frequency channel, time slots, radio, microwave, satellite, modulation, pulse coding, etc.

The circuit interface is the same, regardless of the physical implementation which does not interfere with HDLC.

Virtual Circuits

A facility called "virtual" circuit has been introduced in recent developments of public transmission networks. This facility provides a point-to-point transmission service on switched or permanent virtual circuits.

As opposed to "real circuits," their interface is designed only for the transmission of packets, following the rules of a specific transmission procedure which does not conform to HDLC.

Virtual circuits, as defined in the CCITT draft recommendation X-25, introduce incompatibilities which cannot be resolved without additional complexity and cost to the user.

- A DTE working in X-25 cannot communicate with a DTE working in HDLC.
- DTEs working in X-25 cannot communicate except through a public virtual circuit facility.
- Public virtual circuits do not allow access to DTEs working on X-21 and HDLC standards.
- There is no provision to access DTEs through a switched-circuit facility.
- There is no datagram facility.

In summary, X-25 will lead to a variety of DTE interfaces depending on the configuration in which they will be inserted, e.g.:

- HDLC to HDLC.
- X-25 to X-25.
- HDLC to X-25.
- DTE calling through a switched-circuit network.

This proliferation of interfaces would be detrimental to the user interest and would create difficulties or impossibilities to communicate between DTEs located in different countries or attached to different networks.

An analysis of X-25 shows functions placed at the packet level are somewhat redundant with those found at the X-21 and HDLC levels. They are also a major source of incompatibilities with HDLC DTEs and switched-circuit networks.

Further analysis shows all functions found at the packet level of X-25 can be performed as well at the HDLC level. Should this approach be taken, a number of advantages would result:

- A single universal HDLC interface.
- Compatibility between DTEs regardless of the communication media.
- Compatibility between DTEs attached to private or public networks.
- A datagram facility without additional complexity.
- Reduced processing overhead at the DTE interface.
- Reduced number of packet sizes at the DTE interface.

The present X-25 recommendation is a major concern as it introduces a new area of incompatibilities. On the other hand, all functional aspects of X-25 can be covered by a proper use of of HDLC.

The simplification and generality resulting from the definition of a universal DTE interface is so important it is recommended the International Standards Organization (ISO) and CCITT undertake without delay a revision of X-25.

Pouzin is director of the Cyclades experimental packet-switched network in France.

AM Helps Banks Face Two EFT Realities

By Ronald A. Frank
Of the CW Staff

CLEVELAND – Users who install bank terminal equipment from nonmainframe vendors always face the reality that their terminals must remain compatible with the mainframe. They also face the problem of consumer acceptance.

One way terminals can transmit data to a CPU is through a terminal subsystem controller. And if this controller is a programmable device with software supplied by the terminal vendor, the user has some assurance the terminals will remain compatible.

Addressograph-Multigraph Corp. (AM) here has used the terminal subsystem approach with its bank terminals that are configured as part of a Financial Transaction Delivery System.

The system is currently being used in various check-cashing and electronic funds transfer (EFT) applications. At the center of this system is the AM 7300 and AM 7500 controllers. The controller is an Interdata or other mini that serves as a switch for remote terminals operating at multiple transaction locations.

The company began by simply supplying terminals to banks, but decided bankers did not have the in-house capability to design their own data communications systems, according to Jan Van Gorder, marketing manager for terminal systems.

As a next step, the firm began to offer terminal subsystems with software that would interface the subsystem to the user's CPU. These terminal systems are now operating in various protocols with IBM and Burroughs mainframes, emulating IBM 3270 and 2260 and Burroughs TC 700 terminals.

Consumer Key to EFT

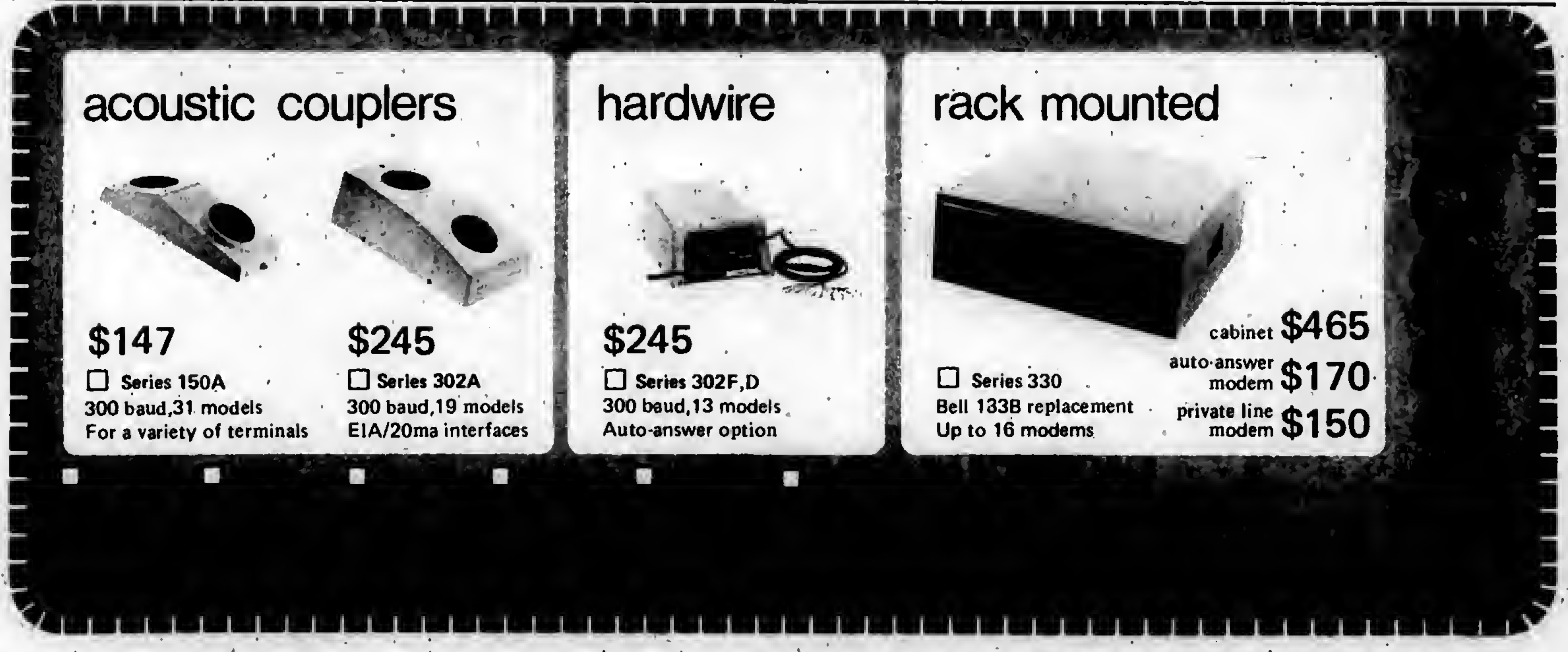
But emerging technology is not the reason for the relatively slow acceptance of EFT systems, according to Victor Levadi, AM's director of terminal systems. The limitations are sociologically oriented; consumer involvement is a big factor in the success of the EFT systems, Levadi said.

AM is currently implementing a supermarket check-cashing system in the Atlanta area that allows customers to validate their own checks. Using a self-service version of the Amcat terminal, the customers can get a validating stamp put on their check so there will be no delay when they pay for their groceries.

At present the system is on-line to a local bank which processes the validation inquiries through its customer data base to ensure the customer has a valid account. But an easy next step would be to perform a monetary transfer from the customer's account to the store's account when the check is presented to the terminal for validation, Levadi indicated.

Thus far the Atlanta system has been well accepted and Levadi attributed this to the fact that the customer is involved in the transaction. One customer benefit is that the service fee the many supermarkets charge for cashing a check is eliminated.

Banks will have to become more responsive to consumers if they want to implement successful EFT systems, Van Gorder said. "Consumers are going to be the drivers. You're involving the public where they buy and where they get their money."



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DP Departments Should Be Used to Trim Phone Bills

By John Dretler
Special to Computerworld

DP departments were founded and still are based on their ability to aid management in reducing corporate costs and increasing efficiency.

This is because of man's ability to make computers manipulate large volumes of data quickly and present this information in a usable format.

It started in general ledger, accounts receivable and accounts payable and has expanded to automatic inventory reorder points, on-line data entry and access and sophisticated financial, marketing and production analysis and modeling.

In summary, it has served as an aid to all major cost and profit centers of business.

Through all this, however, there has been a major cost area that has continued to grow and yet has remained relatively unattended.

It is usually the third or fourth largest corporate expense. Its budget, on the national average, is two to three times the data processing budget.

Rate increases have caused this expense area to grow almost 80% since 1973.

This area is voice communication costs – a company's telephone bill.

Lack of Management

Why has an area like this continued to grow so quickly and remained, in many cases, both uncontrollable and unmanageable? Mostly because business has never applied the necessary tools to manage this expense area.

The telephone expense has always been administered. Once the bill is received, it is logged and then paid.

To manage it required the use of disciplines which most frequently exist in the DP department and nowhere else within a company. Thus, as goes the computer group's interest in voice communications, so goes voice communication costs.

To explain this point, one can quickly look at the average corporate telephone bill. The costs are broken down into two areas – equipment and usage.

The major part of the expense is usage. In the private branch exchange (PBX) environment, usage accounts for 70% of the expense (50% in Centrex systems). It is also the most volatile. It changes both in activity as well as cost from month to month.

The other 30%, equipment, is fairly stable from month to month and should exist only to best serve the usage requirements of a company. As a result, telephone usage is the area that deserves the most attention and creates the biggest problem.

Usage Expense

Usage expense is very much like the general ledger or accounts receivable. It consists of thousands of pieces of data (telephone calls) presented in an unintelligible format (telephone bills) on a continuing basis (monthly).

The person receiving this information in a company is often unaware of where the majority of the activity is, how to minimize costs, what the level of service to the users is, what type of network to install or what level of telephone misuse exists.

However, it would be impossible for the user to do this with a high degree of thoroughness on a monthly basis. The user has that age-old problem of having a lot of data, but not in a usable format to minimize cost and maximize efficiency. To attain these objectives requires continuous manipulation of the information and the analysis of the results.

What DP Does Best

This, it seems, is what DP departments do best. They take volumes of data and present it in a format that enables management to improve its level of operation. If for no other reason, this is why DP departments should become involved in the management of the voice communication expense.

There are other reasons, however. Once the data is generated, network design is the next step. Oftentimes this discipline exists only in the computer group.

Recently, minicomputers and microprocessors have become the mainstay of telephone switching systems. As a result, DP expertise would be extremely beneficial in analyzing different systems and their throughput capability.

The integration of voice and data communications requirements could enable a company to avoid duplication of both effort and cost. (Data under voice is a reality in today's environment.)

And, finally, the most frequent method of system analysis (particularly usage) is software systems to analyze and produce management reports. This is done through obtaining toll and Wats tapes from the telephone company or through ancillary equipment which attaches to a company's telephone system.

As a result, no matter which way the user turns, usage or equipment, the ability to improve efficiency requires DP involvement. The potential benefits can be enormous. The application of this already-existing DP expertise has resulted in savings as high as 30% in many companies.

Dretler is president of Telephone Management Systems, Inc. in Needham, Mass. 02194.

GDC Designs LSI Modem For 9,600 Bit/Sec Users

WILTON, Conn. – General Datacomm Industries, Inc. (GDC) has an LSI modem which features 4,800-, 7,200- and 9,600 bit/sec operation. RS-232C and CCITT V.24 interfaces; and operation over basic 3002 lines.

In addition, the GDC 9601 includes constant monitoring provided by a data lamp, marginal circuit and line signal detector indicators, local and remote testing and voice capability for communications with a remote operator, GDC said.

The 9601 has been designed to offer protection against the total range of impairments on a number of different types of circuits, it added.

Configuration flexibility is provided by strap options, switch-selectsble transmission rates and an optional two- or four-port multiplexer, GDC said.

The modem is also designed for point-to-point applications utilizing four-wire circuits and operating full-duplex through a continuous carrier, the company said.

The 9601 costs $7,250, with quantity discounts available. Delivery is in 30 days, GDC said from 131 Danbury Road, Wilton, Conn. 06897.

Putting the minis in their proper places.

Read *Minicomputers and Small Business Systems* in the August 30th *Computerworld*.

The minicomputer market is bullish and booming. Minicomputer shipments will reach approximately $1.3 billion in the U.S. this year -- nearly triple the value of units shipped in 1973 (Source: International Data Corporation, the world's largest EDP market research firm). The fundamental reason for this rapid growth is the mini's declining cost, which has given rise to a wider and wider variety of uses for these versatile machines. Once a creature of the laboratory and scientific environment, minis can now be found doing everything from on-line network control to functioning as CPU's for complete small business systems (many of which are found in very large businesses, as the idea of distributed data processing begins to take hold).

In our August 30th supplement, edited by Esther Surden, we'll be taking an in-depth look at minicomputers and small business systems. Using application stories and tutorials, we'll examine how minicomputers function in distributed processing environments. We'll also have a survey of distributed processing: who uses it, what it is, and where it's headed. We'll analyze current trends in minicomputer development and discuss what the "superminis" have to offer. We'll also present a variety of stories on small business and turnkey systems. We'll examine the different types of systems available, the hardware and software features they offer, and look at how costs compare with benefits for some first-time users converting to a small business system.

Whether you're a giant professional computer site, or one of the smallest first-time users, this report will have important information for you. It's in the August 30th *Computerworld*. If you're a minicomputer manufacturer, a systems house specializing in minicomputer enhancements, or a small business system vendor, you should advertise here. Don't miss the August 13th ad closing. Contact your *Computerworld* salesman to reserve your space. Or call Judy Milford at (617) 965-5800.

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Terminal Transactions

Portable Unit From Termiflex Designed for Mini, Micro Users

NASHUA, N.H. – Termiflex Corp. has introduced a hand-held interactive terminal designed for use with the Intel Corp. 8080-based SBC 80/10 and other mini and microcomputer systems.

The HT/2 communications terminal is a portable but non-battery-powered device which operates on-line to the computer system, according to a company spokesman.

A full, 20-key Ascii character set is complemented by a 20-character, 5 by 7 dot matrix character format LED display with a 1K-character display buffer for scrolling purposes, the spokesman said.

It features switch-selectable transmission speeds of 10-, 15-, 30- and 120 char./sec in a bit-serial Ascii format, he added.

Technical documentation is provided by Termiflex, the spokesman noted.

The HT/2 is priced at $1,775, with a delivery schedule of 30 days, the spokesman said from 17 Airport Road, Nashua, N.H. 03060.

Joysticks Link CRTs With DG, DEC Minis

SAN DIEGO – Megatek Corp. has two Joysticks for interactive computer graphics which provide the operator with interface ability to the CRT through any Data General Corp. (DG) Nova or Eclipse or Digital Equipment Corp. PDP-11 series mainframes.

The Megraphic Joystick models A and B provide the minicomputer interrupts at a 100-Hz rate to allow the operator to position a cursor on the CRT. In addition, Joy B has a user-controlled switch on the end of the stick to provide status information, the firm noted.

Both the Joy A and Joy B are CRT-independent and, as such, are compatible with any CRT operating with the DG or DEC minicomputers, a Megatek spokesman said.

A Joy A, without the status switch, costs $1,150; the Joy B costs $1,300, the spokesman said. Both prices represent sticks for a DG Nova interface and include a software driver, he added.

Megatek is also considering offering special interfaces, the spokesman said from 1055 Shafter St., San Diego, Calif. 92106.

Telxon RAM Device Sends Data Over Regular Lines

HOUSTON – Telxon Corp. has a portable, solid-state random access memory (RAM) terminal designed to record and transmit business information over ordinary telephone lines.

The Telxon 717 features a 24-key keyboard and 12-character Burroughs Corp. Panaplex display, the company said.

A 300 bit/sec acoustic coupler comes with the terminal; couplers with transmission speeds up to 1,200 bit/sec are available as options.

Also offered as standard equipment are a battery pack and 1K byte of RAM, with 2K and 4K characters of memory available optionally, the company said.

The Telxon 717 includes check digit verification, entry counter, memory search and enforced header features. It is priced at $845, Telxon said from 3726 Dacoma St., Houston, Texas 77092.

Syntech Adds Control Unit

ROCKVILLE, Md. – Syntech Corp. has a terminal control unit which is said to reduce the number of computer ports, modems and transmission lines required in a nonpolled, multiterminal network.

The TCU-8 allows one computer port or modem to service up to eight terminals via a time-sharing technique and is cascadable to achieve further efficiencies, the company said.

Terminals can be arranged side by side with the TCU-8 or extended any distance from the unit via conventional or limited-distance modems, Syntech said.

The device reportedly handles transmission speeds up to 9,600 bit/sec and is priced at $995.

Syntech can be reached at 11810 Parklawn Drive, Rockville, Md. 20852.

Lear Has 'Do-It-Yourself' ADM-3

ANAHEIM, Calif. – Lear Siegler, Inc. has a "do-it-yourself" assembly kit for its ADM-3 dumb terminal.

Priced at $875 (as opposed to $1,280 for a factory-assembled model), the dumb terminal kit gives the builder a 24-line, 12-in. screen capable of displaying 1,920 characters at 80 char./line. The standard set is 64 Ascii characters generated by a 5 by 7 dot matrix displayed as upper case, plus punctuation and control.

The kit comes with two basic assemblies: the CRT section which is premounted in the cabinet, and the display electronics section, with keyboard control and power supply also premounted.

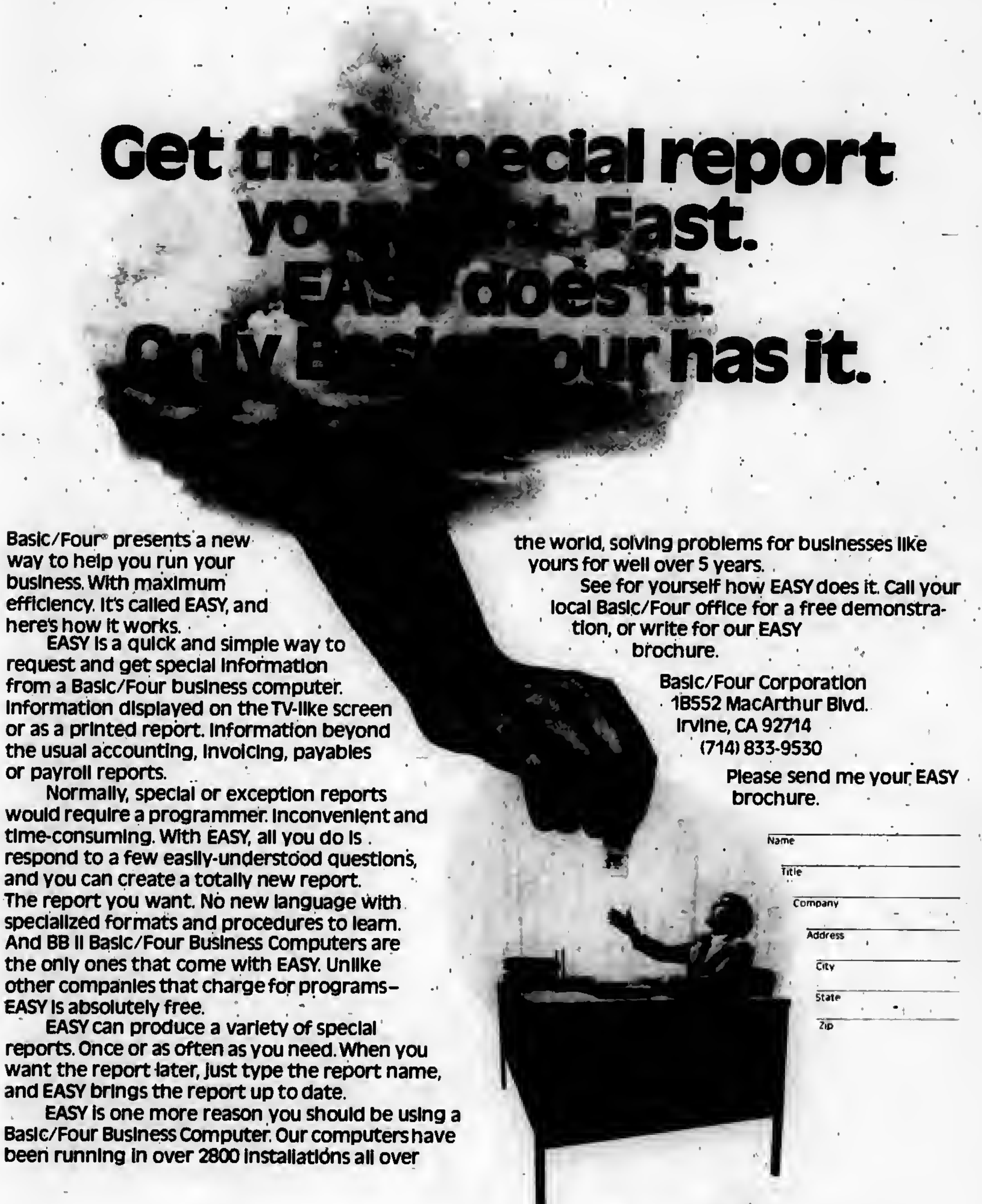
The printed circuit board has sockets ready for installation of all integrated circuits.

The user reportedly can assemble his dumb terminal using basic tools: soldering iron, needle-nose pliers, wire cutters and a screwdriver. Illustrated instructions are said to provide straightforward, step-by-step procedures.

Owners will connect the dumb terminal to their own micro or miniprocessor or using an acoustic coupler, call a remote computer.

The ADM-3 will replace a teletypewriter, offering software compatibility through both a switch-selectable 20-mA current-loop interface and the EIA standard RS-232C interface for direct connection to a computer port. For hard copy, an optional auxiliary extension RS-232C port for interfacing a serial asynchronous Ascii printer is available. This port will also interface with a tape recorder or other data terminals.

Lear Siegler is at 714 North Brookhurst St., Anaheim, Calif. 92803.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SYSTEMS&PERIPHERALS

Bits & Pieces

NBS Extends Calibration To High-Density Surfaces

WASHINGTON, D.C. – The Institute for Computer Sciences and Technology of the National Bureau of Standards (NBS) has extended its unrecorded low- and medium-density magnetic disk calibration services to include high-denstiy (12-disk pack) data surfaces.

Each high-density data surface submitted will be calibrated with respect to the primary standard reference data surface established and maintained by NBS, the institute said. Submissions will be calibrated at both 1.6- and 3.2 mHz on tracks 000 and 410.

The cost for this service is $325. Additional information is available from the Data Acquisition and Storage Section, Computer Systems Engineering Division, Room B-212, Building 225, NBS, Washington, D.C. 20234.

Printer Controlled by Micro

WAKEFIELD, Mass. – Dataroyal, Inc.'s IPS-7 Intelligent Printing System is a bidirectional matrix printer controlled by an Intel 8080A microcomputer and designed for OEM and systems applications, according to its vendor.

The printer, which can be used with minis, micros and large systems, features standard parallel interfacing, making the unit plug-to-plug compatible with other matrix printers, Dataroyal said.

Options include EIA RS-232 or 20mA current loop interfaces with error checking, variable-sized alphanumeric characters and bar code features, the firm said.

The IPS-7 is modular, a spokesman noted. When a user buys the printer, all necessary hardware is already incorporated into the unit; options are added by plugging in additional electronics, he explained.

A IPS-7 printing one-size 1/9-in. high character with a parallel interface and 5 by 7 character font costs $2,175, the spokesman said, with other configurations available at increased cost. Dataroyal is at Main Dunstable Road, Nashua, N.H. 03060.

ADI Add-On Disk Fits PDP-8

CHATSWORTH, Calif. – An add-on head-per-track disk memory system for the Digital Equipment Corp. PDP-8 minicomputer has been introduced by Alpha Data, Inc. (ADI).

Capacities of the ADC-8 can range from 212K words to 2M words with an average access time of 8.4 msec, ADI said.

The memory system costs $6,800 each in quantities. ADI is at 20750 Marilla St., Chatsworth, Calif. 91311.

Take 'Winchester' One Step Further

CDC Disks Increase 370 Users' Storage

MINNEAPOLIS – Control Data Corp. has introduced what it said is an advancement in the "Winchester" data module disk storage technology for users of IBM 370 computer systems.

The CDC 33801 family of disk subsystems increases the storage capacity of a single-disk drive to 400M bytes of data that can be accessed directly by the CPU, the company said.

The subsystems provide 800M- to 12.8M bytes of data storage and require a single CDC 38302 disk storage controller, according to the company.

The CDC 33801 subsystems can be used with IBM 370 systems under the control of OS, DOS OS/VS and DOS/VS and require no software modifications, the firm said.

Each 400M-byte drive appears as two logical CDC 33302-11 (IBM 3330-11) disk storage units of 200M bytes each. Fixed-head storage on three models (the A2F, B2F and C2F) is contained on the first of the two logical volumes, according to a spokesman.

Each drive unit in the disk subsystem series includes recording disk, read/write heads and head arms in a sealed unit for protection of recorded information, CDC said.

Data is transferred at a rate of about 1.2M byte/sec; average data access time is 25 msec.

Each disk storage unit consists of two drives and one to four units can be configured in a single string. Up to four strings – 32 drives – can be attached to the universal CDC 38302 storage control unit, the company added.

Drive units are available in six models. The 33801 A2 and A2F with fixed-head storage contain two drives, data modules and associated control logic. These attach directly to the storage control unit.

The models B2 and B2F also include two drives and modules. Up to three of these units can be attached to a single A2 and A2F, according to CDC.

Alternative control logic is provided with the two-drive C2 and C2F units that connect to the 38302 storage controller. This alternate logic can be manually selected as backup for the A2 and A2F models, the firm noted.

Control Unit Features

CDC's 38302 universal storage control unit is used with the 33801 disk subsystems. The 33801 units can be intermixed on the same controller with CDC 33301, 33302 and 33401 or equivalent disk products.

This capability also enables the 33801 subsystems to serve as staging devices for CDC 38500 mass storage systems, the company noted.

Purchase price of a Model A2 disk storage subsystem is $44,840 or $1,180/mo on a three-year lease. The Model B2 costs $35,910 or $945/mo.

The C2 with manually activated control logic is priced at $46,360 or $1,220/mo.

The three fixed-head storage units in the 33801 family carry purchase and lease prices of $57,000 or $1,500/mo for the Model A2F; $48,070 or $1,265/mo for the B2F; and $58,520 or $1,540/mo for the 33801 C2F.

Prime shift maintenance charges range from $150/mo to $260/mo; initial deliveries of the disk subsystem family will be made next summer, CDC said from Minneapolis, Minn. 55440.

Burroughs Input/Display Units Work With All of Firm's CPUs

DETROIT – Two input and display systems introduced by Burroughs Corp. are said to provide users with a choice of methods for displaying data, communicating with a CPU, entering data at remote locations and receiving and storing data for remote display and printing.

The TD 730 and TD 830 can be equipped with a variety of keyboards and peripherals devices including cassette tape stations, magnetic card readers and printers, the firm said..

Both systems can be used with the entire range of Burroughs computer systems, a spokesman added.

Tbe TD 730 uses the Burroughs Self-Scan II panel which displays up to 480 characters in 12 lines of 40 characters each. The screen can be configured to provide 256 characters in eight lines with 32 char./line.

The TD 830 uses a compact CRT which can display up to 2,000 characters, Burroughs said. Screen format consists of 24 lines or 80 characters each for data and another line of 80 characters to display system status.

The TD 830's memory can be expanded to a total of 4,080 characters and can be divided into multiple pages for display puposes. A buffer feature allows data to be entered by the operator on one page while communications of peripheral data can be received on or transmitted from another page, Burroughs said.

Both the TD 730 and TD 830 can blink a designated character or characters to accent data and "secure video," a technique which allows security data to be entered and transmitted but not displayed on the screen, the spokesman explained.

The editing capabilities of the two systems provide a variety of methods for data correction and update, Burroughs said, noting information can be changed by character, line, field and page.

A special search mode is also provided to the system to automatically position the cursor over a designated error character, the firm said.

A page roll up/down feature causes the data on a page to roll up or down while the cursor remains in a fixed position. A scrolling feature allows the contents of data memory to be displayed sequentially without regard to page boundaries, according to Burroughs.

Each system incorporates a status display which indicates existing or previous system error conditions, cursor page number and a data field for central system status messages. On the TD 730, two display lines are used alternately for data and system status.

Peripheral capabilities for the two systems includes a matrix printer tha operates at 60 char./sec and line printers that operate at 85-, 160- and 250 line/min. Each auxiliary printer may be shared by up to three TD systems, Burroughs said.

A typical TD 730 and 480-character Self-Scan II panel costs $3,635 with a one-year lease rate of $115/mo. A typical TD 830 has a purchase price of $4,285 and a one-year lease rate of $135/mo.

Deliveries will begin in the third quarter from Burroughs at Burroughs Place, Detroit, Mich. 48232.

Skandia Insurance Covers DP Misuse

STOCKHOLM, Sweden – The Skandia Insurance Co. Ltd. is offering insurance protection against computer misuse and its associated capital loss.

Intended primarily for companies which furnish DP services to other firms, the insurance is also available to companies which have their own DP operations. Coverage ranges from property to legal protection insurance.

A premium is set according to value of the property, type of building, location and other factors, including the number of employees, salary of employees and size of the deductible, the firm said.

Skandia, a member of the Skandia Group, can be reached at Box S-103 60, Stockholm, Sweden.

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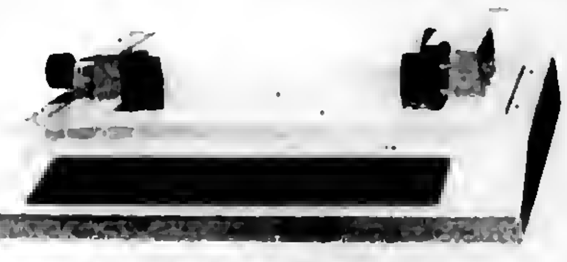

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In the Used Market—Part 1

Sale of CPU Involves Series of Steps

By Sonny Monosson
Special to Computerworld

Used computers are not junk but a high-value business asset. Purchases in the used equipment market, therefore, are a serious alternative for the user interested in a good cost-performance upgrade and concerned about getting the most out of expanding his present line of equipment.

An absolute first step in consideration of the sale of any used computer is to check the investment tax credits taken on the equipment and the contingent tax liability that may occur with resale.

There are cases in which credits taken must be repaid to the Internal Revenue Service if the equipment is sold too soon after purchase.

Some owners of equipment have used a "test of market" as input to their own decision on equipment disposal. This offering of equipment for sale is basically to determine its value.

But the "test of market" is frequently quite frustrating to all parties involved, particularly to the possible seller. Offers often evaporate into thin air when it's time to sign a purchase and sale agreement.

A less costly and more responsive answer may be obtained by soliciting the services of an independent appraiser. Organizations involved in the used computer market often will provide a professional appraisal of the market for the equipment.

Extremely accurate appraisals are difficult, however, even for the "experts," because of thin markets for many types of equipment. In addition, the characteristics of the used computer marketplace are totally different from those of the new.

Used computer values are not based on the intrinsic value of the equipment. The age of the equipment, for example, is a relatively insignificant factor in establishing current or continuing fair market value — at least where the so-called thin markets exist.

Such price degradation must certainly be anticipated where the equipment configuration is of a highly specialized character. The seller is likely to encounter zero interest in major portions of a specialized system offered for sale — and this lack of interest will correspondingly force used values to zero.

The organization selling a machine originally manufactured by a defunct company and with no maintenance alternatives will also encounter similar severe drops in value.

But such considerations are often of little concern to the buyer — whether of new or used equipment — for the intrinsic value of the system to him is a major criterion against which he weighs his original acquisition.

A lending institution accepting such equipment as collateral, on the other hand, has a considerably different viewpoint. If it becomes necessary to foreclose, such equipment must generally be resold in order to recover at least a portion of the principal.

Time to Sell?

An organization which desires a trouble-free transaction in either purchase or sale must take particular cognizance of scheduling the transaction — particularly in the case of disposal of equipment.

Waiting until equipment usage has ceased, whenever that is, before offering it for sale tends to depress its value, whereas immediate delivery — or at least a firm commitment for delivery on a fixed date — is required for actual sales activity to occur.

When equipment will not be available within a reasonable period of time (four months at most), the seller will probably find attempts at sale either directly or by broker activity are frustrating.

Dealers, however, may be found willing to estimate future values and buy on speculation that the equipment will retain some value over a period of time.

The user, in any case, must be prepared to transfer the title precisely as agreed or pay the previously established penalties for any delays.

On the other hand, the user should not wait until he turns the machine off to offer it for sale. The machine should be offered for sale at least two months before it's no longer needed. This allows time for the sales activities, such as advertising, financing, negotiation and shipping.

Part II will discuss maintenance and how it affects the prices of used equipment.

Monosson is a past president and now chairman of the Computer Dealers Association and is president of American Used Computer Corp.

CMI Add-On Memory System Offers 8M Bytes to IBM 370/168 Users

BEDFORD, Mass. — An add-on memory system designed for use with IBM 370/168 computers is being offered by Cambridge Memories, Inc. (CMI).

Designated the 370/Stor 168, the system can be expanded from 1M bytes to 8M bytes in 1M-byte increments, the vendor said.

Compatible with all IBM 370/168 processor models, the CMI memory is transparent to all IBM-supplied programs and operating systems software as well as to microcode and maintenance diagnostics, the firm added.

It can operate within multiprocessor systems with no system degradation because the 370/Stor 168 uses N-channel static memory devices rather than dynamic devices, CMI said.

"The constant recharging of dynamic devices increases the chance of single-bit errors, but the N-channel MOS chips used in the 370/Stor 168 system are able to hold their charge without refreshing," a spokesman explained.

Any failing 1M-byte partition can be determined by the system operator with a customer panel included in the system; an off-line switch aids problem detection by allowing all of the CMI-supplied memory to be removed, leaving IBM-supplied memory functioning, the firm said.

Maintenance Panel

A maintenance panel is also included which provides problem determination capabilities down to the modular board and single-bit levels and allows problems to be diagnosed and corrected off-line.

Single-bit errors are automatically detected and corrected by failure-anticipation circuitry built into the system, and multiple-bit errors are automatically detected, after which the system supports the software error checking and retry facilities of the 370/168 central processor.

The system can be purchased for $125,000 per megabyte. A 36-month lease plan costs $4,100 per megabyte plus $400 maintenance. Delivery is 30 days from the firm at 12 Crosby Drive, Bedford, Mass. 01730.

Graphic TV Monitor From Grinnell Lets User Design Display Format

SANTA CLARA, Calif. — Grinnell Systems Corp. has a graphic television monitoring system that reportedly displays real-time process data and annunciation information in user-designed formats with or without a computer.

The GIR-2 works with standard television monitors and needs 256 or fewer picture generation instructions, Grinnell said.

In computer-based applications, the GIR-2 takes up little core memory; without a computer, picture format, grid and annotation instructions are stored in programmable read-only memories, according to the firm. Data display instructions are then supplied by the real-time data stream.

The GIR-2 generates a picture on a 256-element by 256-line matrix using alphanumerics, graphic rectangles and scale grids. Alphanumerics can be displayed in four sizes, including the 64-character Ascii set plus as many as 63 user-specified symbols; up to 450 characters can be displayed simultaneously, a spokesman noted.

The GIR-2 system consists of a controller and one or more display channels. The controller includes the control logic, a power supply, a 19-in. rack-mount chassis and a standard 16-bit interface. Other interfaces are available.

Prices for a GIR-2 controller and one display channel start at $4,950 from Grinnell at 2986 Scott Blvd., Santa Clara, Calif. 95050.

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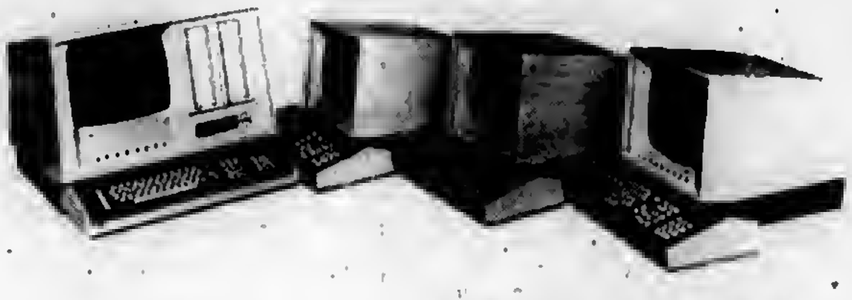

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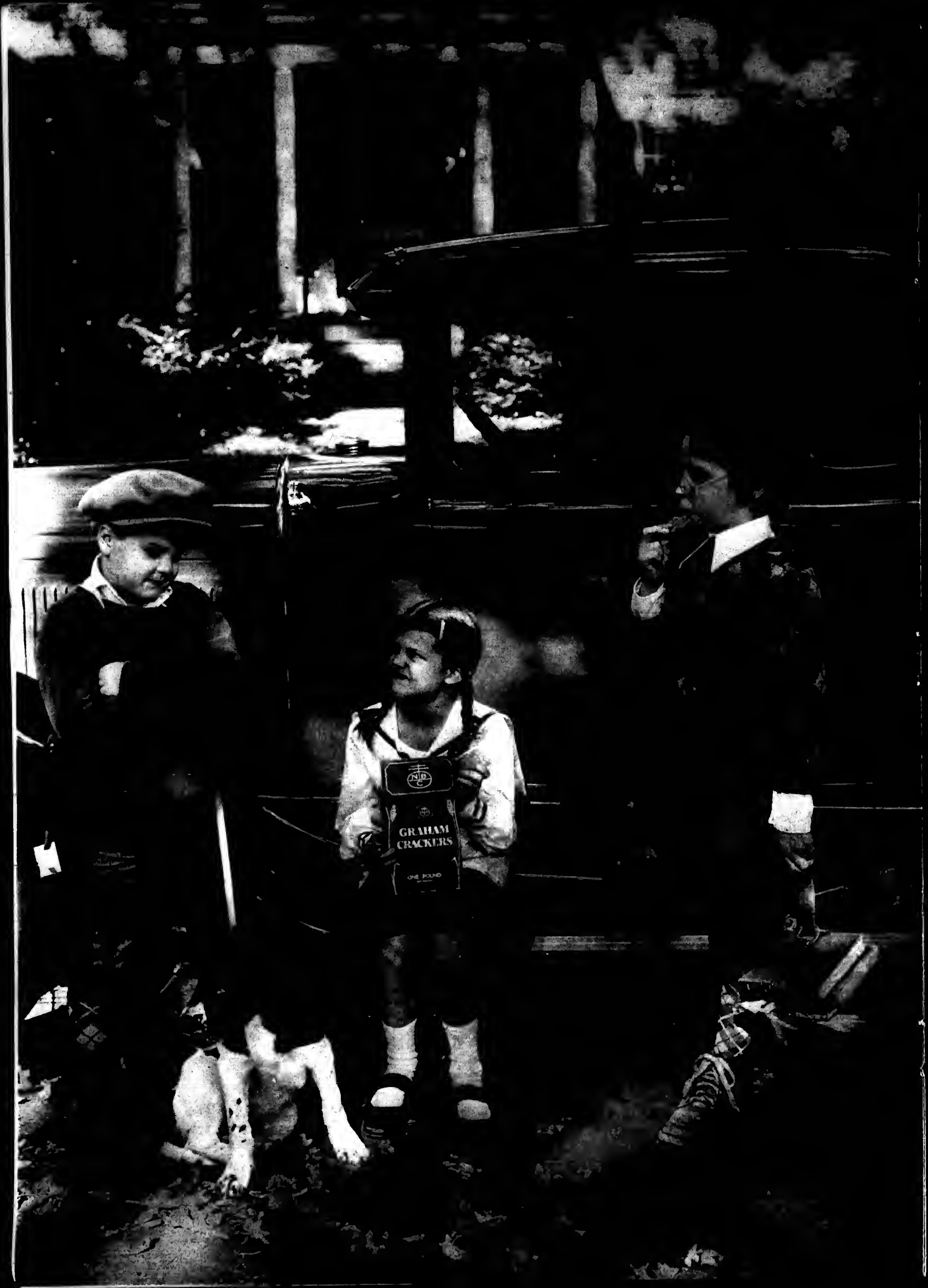
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Mini Bits

Mini/Micro Conference To Cover Range of Topics

SAN FRANCISCO – Memory peripherals, OEM peripherals in end-user systems, microcomputer selection criteria, minicomputer maintenance, computer law and financing a growth company in today's environment are some of the topics to be covered Oct. 19-21 at the 1976 Mini/Micro Computer Conference and Exposition here.

In addition to sessions, a special "paper day" has been set for Oct. 21 to focus on individual papers not necessarily related, according to a conference spokesman.

Over 75 companies are scheduled to exhibit, including Digital Equipment Corp., Microdata Corp., Interdata, Inc., Diva, Inc., Intel Memory Systems and National Semiconductor.

The conference and exposition will cost $40 for the three days or $15/day. Exhibitor guest passes will be good for the conference and exposition.

Additional information can be obtained from Robert D. Rankin, 5544 E. LaPalma Ave., Anaheim, Calif. 92807.

Basic/Four Users Organize

DUARTE, Calif. – A group formed "to improve programming and promote an exchange of ideas" among Basic/Four users has been formed in southern California, according to the group's spokesman.

The group is open to owners and users of Basic/Four equipment. A monthly newsletter will be published for group members and periodic meetings and seminars are planned to "promote more effective DP operations," the spokesman said.

Basic/Four owners interested in joining the Western Basic/Four Users Association should contact Larry Hanks, President, P.O. Box 217, Duarte, Calif. 91010.

Papers on Micros Sought

OKLAHOMA CITY, Okla. – Prospective authors are invited to submit abstracts of papers to the Microcomputer-77 Conference and Exposition to be held here next April 6-8.

The conference is sponsored jointly by the University of Oklahoma and the IEEE Computer Society.

The conference will focus on microcomputer systems with a survey of the range of current applications and an exploration of potential areas for future development.

Deadlines are Oct. 1 for abstracts and Dec. 1 for papers. Additional information can be obtained from Dr. S.C. Lee, School of Electrical Engineering, University of Oklahoma, Norman, Okla. 73019.

As Firm's Business Doubles

Turnkey Keeps Dealer Out of the Woods

By Esther Surden
Of the CW Staff

DALLAS – A turnkey minicomputer at a wholesale distributor to the lumber business here has coped with this company's increased growth, according to a spokesman.

"In the last year [before installing the system] we have almost doubled our business, and it was either go to a computer or hire additional clerks to sit at additional typewriters and bookkeeping machines," Steve Baker, accounting manager for Dallas Wholesale Builders Supply, Inc. said.

The company has sales in excess of $1 million/mo of materials such as panels, moldings and doors. It has about 500 customers ranging in location from the Gulf of Mexico to Oklahoma, he added.

The firm made the decision to look for a minicomputer because Baker felt a small system would fit the size of the business. A minicomputer also "offered a lot more to us than a batch system associated with larger scale computers," Baker said. A real-time environment was a must, he noted.

Primary Needs

The primary applications the company needed on the system immediately were billing and inventory, so the firm searched for a system suited to its needs. Finally, a turnkey mini dealer with systems in the wholesale distributor's area came to the company's attention.

"The software it had at that point in time was basically what we needed, with some enhancements in some areas," he said. In addition, the Data General Corp. (DG) hardware used in the Electrofile, Inc. configuration seemed to be a good choice.

Complete Turnkey

The system was installed as a complete turnkey from Electrofile. It includes a 32K-word DG Nova, disk, a teletypewriter, three CRTs and two printers. One of the printers, an 80 char./sec model, is used exclusively to produce delivery tickets. All the programs are written in Fortran running under DG's Disk Operating System, he added.

Prior to acquiring the automated system, the firm had been using an Olivetti bookkeeping machine, he continued.

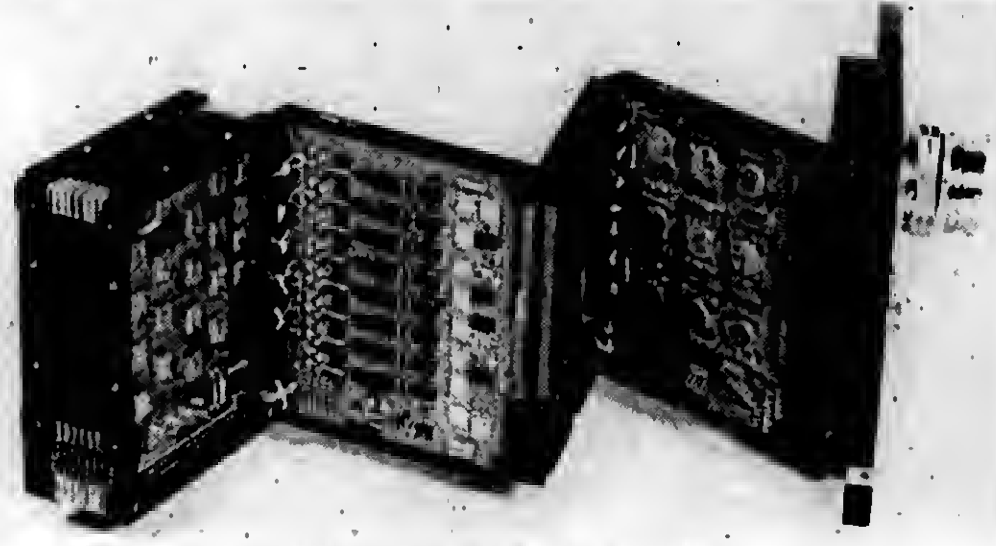
The system now handles receivables, payables, inventory, purchasing, historical sales reports and order entry. The company has about seven inside and seven outside salespeople and, when orders are taken, they code an order sheet, from which the orders are then entered into the system. The historical sales data presents management information such as the percentage of profits and breaks the information down by salesperson.

Within a Month

The installation was up and running with invoicing and billing within a month after the computer was installed, he continued. This was a big factor in its choice, since the crunch of added sales was bogging down the firm's turnaround time.

All the system components are known manufacturers' equipment, he said, so the risks in deciding on a turnkey system were minimized. The company also "checked the background" of the turnkey house before the purchase to assure it was a solid company, Baker noted.

Minis to Probe Cosmic Secrets



The CDC system is hinged like an accordian.

MINNEAPOLIS – Three 6-1/2-lb computers at the helms of astronomy observatories to be launched between 1977 and 1979 will help the National Aeoronautical Space Administration (Nasa) study such cosmic mysteries as pulsars, black holes, quasars and radio galaxies.

The Control Data Corp. ruggedized systems will control the altitude of three High Energy Astronomy Observatories to study celestial bodies that cannot be studied from earth because our atmosphere filters out their high-frequency rays, according to a spokesman.

Nondestructive Memory

The system will have an 8K-word nondestructive read-only memory with expansion capability to 16K words. The extra 8K of memory can be reprogrammed in orbit if necessary, a spokesman said. The system hinges to fit into its shock-resistant case.

The microcomputers use LSI technology; the memories will use either plated-wire or semiconductor technology, the spokesman said.

The project is being developed under a contract to TRW Systems awarded by Nasa in 1974, he added.

Diva Has Intelligent Disk Controller

EATONTOWN, N.J. – The Computroller V from Diva, Inc. is an intelligent disk controller compatible with Digital Equipment Corp. PDP-11, Interdata and Data General Corp. Nova and Eclipse minicomputers, the vendor said.

The controller responds to the code written for the CPU vendor's own disk peripheral of equivalent capacity and requires no special I/O driver, Diva said.

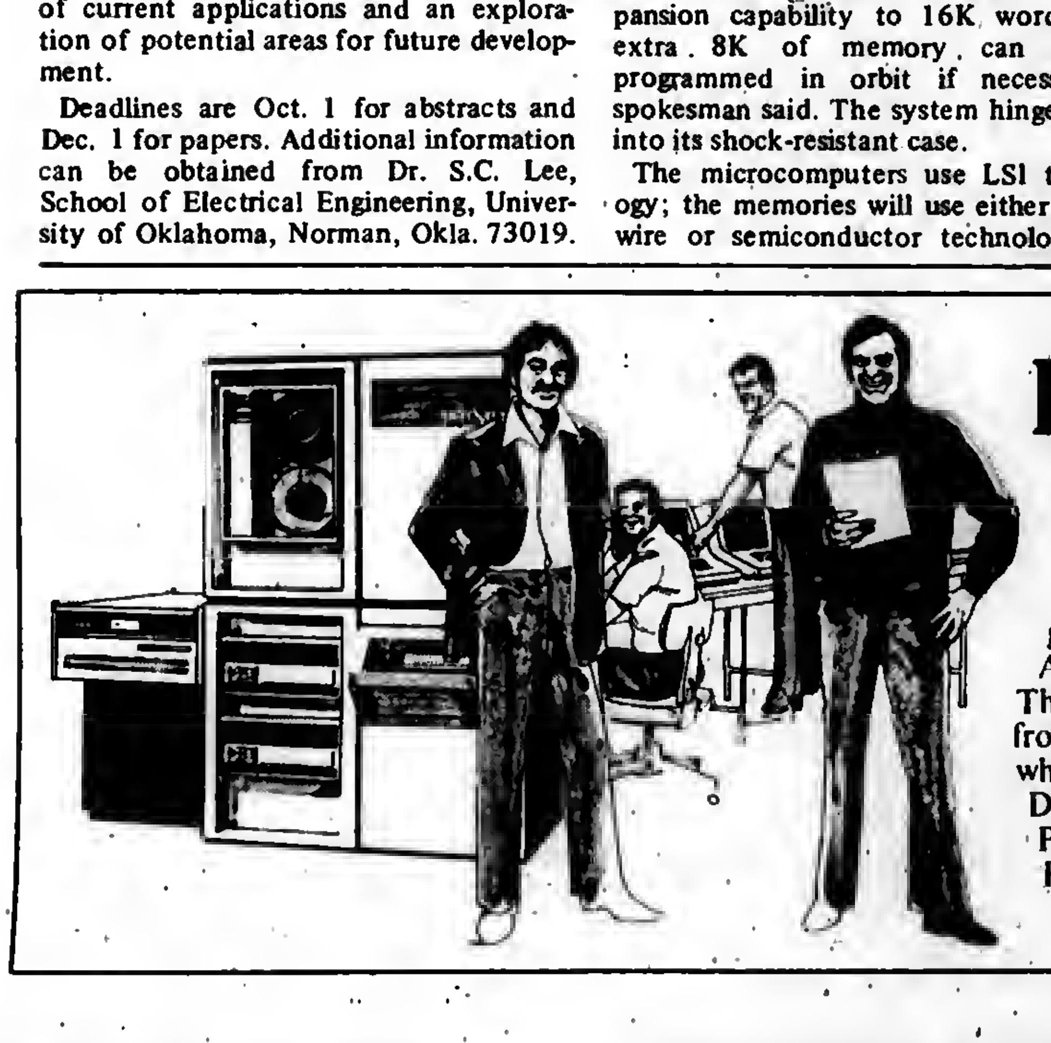
Diva will keep the system current with the vendors' software releases, a spokesman said.

A custom coupler board plugs directly into the mainframe I/O slot. The system includes Ampex or California Computer Products, Inc. 3330-type drives; its capacity can range from 25M- to 300M bytes, the firm said.

The interface can support Control Data Corp. and Memorex drives as well, the spokesman noted.

The Computroller V comes in two models. The V/DD-50 accommodates "short-stack 3330 drives" ranging in capacity from 27.3M to 82.1M bytes; it costs $13,600 to $17,500.

The V/DD-40 accommodates the full 3330-type drives that range from 100M- to 300M bytes; it costs $24,200 to $28,600, Diva said from 607 Industrial Way West, Eatontown, N.J. 07724.



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PRIME

Of All Alternatives Offered to Novices, Turnkey System May Prove Best Choice

By Jon David

Special to Computerworld

Minicomputer Exchange

Many companies installed large computer systems, yet found they frequently could not get them to do the jobs that were necessary. Since minicomputers are even more difficult to use than large computer systems, this is even more likely to happen with a minicomputer purchase.

If a company were to buy a minicomputer for, say, standard commercial applications (order entry, accounts receivable, inventory, etc.), it would be faced with the problems of getting the system programmed.

Many minicomputer vendors offer higher level languages and operating systems to facilitate program development by noncomputer personnel. They encourage prospective customers to buy their hardware and do their own program development to both minimize initial costs and have the programs developed by the men who understand their applications best, namely the customer and his staff.

What's wrong? Although the programming languages frequently available today are easy enough for the use of noncomputer people, there is more to programming a system than writing programs.

If one does not intelligently design a disk file structure, one may find he requires 10M characters of disk to store 1M characters of data; it may take many seconds or even minutes to retrieve individual items of information; information may get lost, improperly updated or not updated at all.

Such things are frequently not too difficult to avoid if you know what you're doing, but such knowledge is not the forte of noncomputer people.

There are many stories about companies who bought minimal computer systems, did their own initial programming, later expanded the hardware and software themselves and are overjoyed at both the performance and cost-effectiveness of their systems; such situations are the exception, however, rather than the rule.

More often than not, the end user who is not well experienced with computer equipment and techniques will develop nothing more than considerable expenses and frustrations if he tries to do his own design and programming.

An obvious alternative is looking to an outside software vendor to do your programming. Such a company does not have to lay out the money for equipment, so you need pay only for service.

If you pay him on an hourly, daily or other rate basis, you may wind up paying for nothing. If you pay him a flat fee for a predefined job, at least you will get something when you are obligated to pay for it.

Just what is it you will be getting? If you ask a vendor to give you a price for order entry, accounts receivable and inventory processing, he would like to give you as low a price as possible for two reasons: first, because you may be considering other vendors; second, because he feels you may be able to afford nothing more than a low price. He may therefore try to give you as little as possible to keep his costs and prices down.

He might not point out to you, for example, that for 10% more money you would get 50% more use; that certain conditions, although rare, might destroy or at least distort your operations or results; that internal control, never visible when it is present, may be needed; that both your programs and files should be structured differently for anticipated expansion in other areas.

In other words, he may only respond to the letter of your specifications, and you are not a computer person.

Readers are urged to reply to this or any other Minicomputer Exchange article. This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area. Letters or manuscrips should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space please.

What happens if a software vendor fails to perform? Obviously, you should not have to pay him anything. What compensates you, though, for your loss of time and your expenses in dealing with this firm?

How does it affect you if the lowest new bid you can get to do your programs is twice what the old one was?

You can frequently get a good job from a software vendor; too frequently, however, you can get severely burned.

Turnkey Alternative

A turnkey system, with one company providing both hardware and software, is another alternative.

Certain computer manufacturers, especially those marketing to the smaller commercial end user, offer turnkey systems. While this may seem the best situation, typically these manufacturers do not develop their own programs for you, but rather contract with independent vendors to program.

Although you are most frequently not obligated to pay for either hardware or software if the entire system fails to meet your specifications, you are in no better a position than if you were dealing with an independent vendor yourself.

Certain systems companies have a product line which deals with situations similar to yours. These companies are usually dedicated to a particular hardware set and are therefore familiar with its characteristics. They can program this equipment to satisfy your requirements as best possible, and as best possible is quite often really good enough.

Being familiar with your type of operation means such a firm can give you certain things you need, although you may not realize it, yet be able to give these to you at a relatively small additional cost.

A disadvantage of such a firm is it stays with a particular equipment set and often has to program around its limitations to satisfy requirements; this inefficient programming often does not become important until you later wish to expand either your applications or your data volumes.

Another disadvantage is it may try to fit inexact, previously developed programs to your particular situation.

Custom Systems Houses

Still in the turnkey area, we have custom systems houses which deal with all, or at least most, equipment vendors. Such companies have the freedom to buy whatever equipment they feel is right for your situation.

Since the minicomputer field is rapidly changing in an ongoing basis, their selection of last year might not well be their selection of this year and is very unlikely to be their selection of next year.

Such a firm will not normally have program elements from previous systems it can immediately give you for nothing, but it can be thoroughly familiar with programming your applications.

If an existing system is not an *exact* fit, however, be aware that many, many firms have discovered the "minor" changes necessary to provide the proper fit have frequently been very expensive in terms of dollars, time and operational efficiency.

As a general rule, nothing is always best, and each situation should be treated differently. A turnkey system offers much in the way of minimizing possible dollar loss and also provides a single source to contact when and if problems arise after installation.

Since, however, there is so much variation even within the turnkey area, if you have an application you wish treated by a minicomputer, you are best off contacting a qualified and independent advisory firm to help you design your application for computer treatment and to select the appropriate vendor or vendors as your situation dictates. If you cannot find such an advisory firm or cannot get appropriate references for such a firm, you should at least try to have the approach on which you have decided reviewed by a qualified independent source.

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and is also president of Systems RDI.

Get the printer capacity you paid for with a Formstacker

"With Formstackers, we can now use the *full* capacity of our high-speed printers." —Mike Menditto, check processing manager, Bankers Trust Company.

With its conversion to Burroughs 9243 high-speed printers last July, Bankers Trust check processing section completed a strategic move to faster processing of check reconcilement listings. The problem was that higher lpm speeds and skip rates were causing continuous forms to misfold and tangle, requiring as much as 15 min. per operational printer hour to clear by hand. Printer downtime was creating costly delays in processing check listings.

Solution? Install four low-cost Model 401 Formstackers™ to eliminate printer jams and tangled printout stacks, enabling high-speed printers to perform at their rated capacity without manual intervention and downtime. Says Mike Menditto: "When a data processing operation reconciles over a million checks per day from all 107 branches of Bankers Trust, its time has got to be vital. With our Formstackers, we now use that time to the fullest by getting the most out of our computer room equipment."

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Engineers No Longer Commuting

Small System Gives Firm Flexibility to Try and Err

NEW ORLEANS – A small business system at Grandolfi Engineering, a structural engineering firm here, provides greater flexibility for the company, according to Michael Grandolfi, president of the firm.

The company had been using both outside commercial service bureaus and the computer center of a local university before obtaining the in-house system. The use of outside services became exceedingly cumbersome, Grandolfi said.

The firm's work involves "a tremendous amount of trial-and-error types of applications" resulting in a "tremendous amount of lost motion," he explained.

After preliminary designs were developed, the engineer drove to the computer center, waited for the job to be run, drove back to the plant, checked the results and recalculated stress factors – only to hop back into the car again.

An in-house system seemed the only alternative to this, Grandolfi said. The company evaluated Hewlett-Packard and Texas Instrument systems before settling on a Wang 2200 and custom engineering software from Structural Programming, Inc. of Lexington, Mass.

Benefits Became Obvious

An example of the benefits of in-house computing was seen when the company designed the structures for 12 offshore oil compressor packages for a customer, Dresser Industries. With the system, the engineering firm prepared preliminary designs for the platforms within three weeks, half the time it would have taken if the outside services had been used, Grandolfi said.

In this instance, the flexibility was particularly necessary because Dresser might have been unable to order the steel it needed for the compressors because steel mill orders were only taken once a month.

Also, the customer's customer, Shell Oil, was losing revenues waiting for the compressors.

"That's why we could not have waited for final designs before ordering steel for the packages," Grandolfi explained. "The alternative, if we could not have prepared accurate preliminary designs in time, would have been to design the packages with larger steel members to make sure the packages could withstand the stresses they would take.

"We might well have used as much as 20% more steel in that case, and the packages we were designing weigh between 500 and 600 tons when completed."

Grandolfi reported that the preliminary designs were "fairly successful. There weren't a lot of changes necessary."

The compressor packages his firm designed for Dresser are installed on offshore oil rigs and contain the mechanical equipment which extracts low pressure gas from undersea wells and compresses that gas for transmission, he explained.

The packages house reciprocating compressors, centrifugal compressors, cooling packages and related hardware, which, depending upon the particular package's construction, must withstand various loads at each joint.

Process Starts With a Guess

The design process begins with an engineer "guessing" the sizes of the various steel members required for a package. That information, plus the number of joints, the coordinates of each joint and the load at each joint would be typed onto punch cards to be fed into the university computer.

When Grandolfi Engineering used the university DP center, it was necessary to shuffle through stacks of punch cards by hand to find the few pertinent cards each time the computer run indicated a change was necessary.

Changes were similarly made on a trial-and-error basis however, and the process had to be repeated each time the engineer guessed wrong.

That same data can now be entered through the keyboard on the Wang computer. The data is stored on a floppy disk.

Formerly, engineers were required to convert that design data into a format the university computer could accept. Grandolfi said nondegreed technicians are now able to feed information to the minicomputer, freeing his engineers for more productive jobs.

"The computer is right here," Grandolfi said. "Now we can guess the sizes of steel members, run those sizes through the computer and, if we are wrong, simply find the appropriate data on the tape, make the changes necessary and run the new design through the computer again."

Grandolfi said his original system, consisting of a 2200 processor with 8K bytes of memory and a dual cassette drive, represented a $17,000 investment.

More Uses Found

"We soon found we had more uses for the computer than we had thought," Grandolfi said, "including naval architectural applications relating to the longitudinal bend of ships' hulls and to the hydrostatic properties of ships. We spent another $8,000 to add an additional 4K of memory, a matrix read-only memory and a triple floppy disk."

The firm currently employs one programmer in order to develop software that cannot be purchased from a vendor like Structural Programming.

The floppy disks presented some problems to the firm when they replaced the tape, Grandolfi noted. Keeping the disks free of static electricity and clear of dirt produced some consternation, but the firm soon realized certain procedures had to be followed to keep the disks running well, he explained.

The company is now in the process of putting its accounting applications online. This has taken some time to do because the engineering applications came first in priority, Grandolfi said.

Eventually the company hopes to sell some time on the system to outside customers who need accounting functions.

The software the firm used in the compressor package design job guides the system operator by flashing a series of questions on the computer's CRT display.

The operator types in the job number, date, number of members, number of joints and the coordinates of each joint. The system then requests the geometric properties of each member in the package and the locations and sizes of the loads the package will have to bear. That load information is requested for varying conditions.

The system then calculates the optimum sizes of members necessary to bear those leads under those varying conditions; therefore, changes in sizes of members might be necessary before the design is finalized.

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Mini Helps Blooming Business End 'Paper Blizzard Problem'

APOPKA, Fla. – The minicomputer at Hickerson Flowers here has solved the firm's "paper blizzard problem" and allowed business to grow at an increased rate, according to the company's general manager.

Prior to automating, Hickerson, a wholesale dealer of Florida-grown house plants, had been using an NCR accounting machine for invoicing and monthly reports, Lillian O'Connell said.

When the company decided more in-house power was needed, the firm considered minicomputers from IBM, Burroughs, NCR and Digital Equipment Corp. (DEC). The DEC system was chosen because "we felt it was designed to do the job better than the others and came highly recommended from people who had the system," O'Connell said.

The system, a Datasystem 340 with 32K bytes of memory, was customized for the foliage industry by Parcomp, Inc., a Cocoa, Fla., OEM software house. The configuration includes 6M bytes of disk, three CRTs, a Decwriter and a 300 line/min printer; it cost the firm about $60,000.

Before the installation of the system about a year ago, the order entry process was strictly manual. Routing lists, delivery tickets, redelivery lists, shipping labels and bills of lading were hand-typed. Extra part-time help was needed to generate the documents for large orders.

Three former clerk/typists now handle the order entry system. The system routes orders to their destinations and keeps a running inventory of plants that are maturing and ready to be shipped, O'Connell said.

The error rate for shipments has been reduced, she added. Shipments are routed, addressed and priced more accurately and there is an automatic pricing structure built into the system with a special price override capability, she said.

With the system, all documents needed for filling a 3,200-case order, excluding invoices, have been generated within four hours, she noted, including time for data entry.

CI Notes

Perkin-Elmer Consolidates Three Firms Into DP Group

NORWALK, Conn. – The Perkin-Elmer Corp. has elevated its computer business activity to group status with the formation of Perkin-Elmer Data Systems.

The group represents the consolidation of Interdata, Wangco and Terminal Products.

"The new group is being established to provide Perkin-Elmer with a strong and coordinated organization to serve the rapidly growing small-system portion of the data processing field," according to Robert H. Sorenson, Perkin-Elmer president.

"With the acquisition of Wangco, Perkin-Elmer's position in the field is significantly enhanced and we now have a broader base to serve both the original equipment manufacturer and end-user segments of the market," he added.

Combined revenues for the new group for fiscal 1976, ending July 31, are expected to exceed $70 million.

Financial Woes Halt CMI

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) suspended all operations last week, idling 350 employees.

The memory maker cited "inability to reach agreement with its leading banks for immediate cash needs" as the reason for the closing.

Earlier last week, the banks had demanded payment of all outstanding loans, totaling some $16 million. This followed CMI's announcement that it expected to report "significant losses" for its third quarter ended May 29.

The company had reported a net loss of $604,000 for the first half of the year as well as a loss of $4.1 million for the year ended Aug. 31.

The employees will be recalled if financing can be arranged in the near future, CMI said.

Bunker Ramo Makes SEC Deadline

WASHINGTON, D.C. – Bunker Ramo Corp. met the deadline imposed by the Securities and Exchange Commission (SEC) for bringing its Telequote III and Market Decision System-7 terminals into compliance with SEC rules.

The requirements by the commission, which is moving toward a central electronic market system, were that the display devices be able to show the most recent sale price of a security as reported on the high-speed lines of the consolidated system and identify the market in which the trade occurred.

Procedures Seen Worsening

GSA Competitive Bidding Found Waning

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Since the Brooks Bill was passed 10 years ago to promote economy and fair competition in government procurement of DP equipment, things have gotten worse instead of better, a recent survey has found.

Last year only 36% of computer systems obtained by federal agencies with advance authorization from the General Services Administration (GSA) were competitively bid. This compared with 60% of systems obtained from 1968 to 1975.

At hearings of the House Government Operations Committee's Subcommittee on Legislation and National Security, Jack Brooks (D-Texas), chairman, blamed this state of affairs on several factors.

GSA, the agency responsible for centralized management of DP procurement, "has repeatedly authorized noncompetitive procurements which were not adequately justified." In addition, it has "failed to enforce regulations" in delegating procurement authority to the agencies and "has failed to provide the management guidance to user agencies" dictated by the Brooks Act.

While the General Accounting Office (GAO) has conducted reviews pinpointing deficiencies in policymaking, procurement, utilization, standards and enforcement of regulations, it has "failed to monitor whether corrective action has been taken," he said.

The Office of Management and Budget (OMB), charged with policymaking responsibility under the law, "has failed to establish concise, clear-cut policy" and, where policies have been issued, "has failed to provide adequate direction in their enforcement."

The National Bureau of Standards (NBS) "has failed to provide the government with necessary hardware and software standards, a situation which Brooks contended is another reason for the growing trend in noncompetitive procurements.

Finally, user agencies have consistently failed to cooperate with GSA when obtaining DP equipment. Instead, they have obtained noncompetitive, unneeded, uneconomical and poorly utilized DP resources, Brooks said.

A.G.W. Biddle, president of the Computer Industry Association, agreed with Brooks' assessment.

The GSA's practice of delegating procurement authority to requesting agencies has become so widespread it is now the rule rather than the exception, Biddle said.

Citing a recently completed DP strategy study for GSA, Biddle said 90% of all procurement requests forwarded to GSA for delegation decisions were granted.

Agencies submit to GSA equipment specifications prepared with vendor assistance that are "loaded" in favor of one particular manufacturer's product, according to Biddle.

"Without adequate technical oversight, the GSA is unable to determine whether the DP product or service being sought is available from other vendors at a lower cost," he said.

GSA should strengthen the technical competence of its DP staff and retain technical oversight, as the Brooks Bill originally intended, Biddle said.

All delayed procurement authorities (DPA) should be published to give all vendors an opportunity to comment on specifications that appear to have been loaded by "overreaching manufacturers and incumbent suppliers," he added.

Shared Guilt

But "overreaching" vendors are not the only ones at fault, he said. Federal agencies continue to violate DP procurement rules through ignorance, arrogance or because of philosophical differences with GSA, giving vendors no effective remedy.

"GAO takes six months to act and then usually finds a way to side with the agency," he said. Congress "rarely interferes with these operational matters and OMB is too understaffed, busy or too reluctant to intercede in anything other than very broad policy matters.

As an example, Biddle cited a practice by various Veterans Administration (VA) hospitals of buying IBM Model 129 keypunches this fiscal year even though the IBM contract with the Federal government prohibited the acceptance of new orders.

As a means of getting around this one-year restriction, the VA rented the devices for one day and then purchased them as "used equipment."

Multiyear Leasing Urged

Biddle also urged the subcommittee members to move forward a law permitting multiyear leasing of equipment.

"Without multiyear leasing, the manufacturer of a large CPU who is a new entrant in the field, such as Amdahl Corp., could not even bid on a request for procurement, he said.

Multiyear leasing should not be restricted to the "ADP revolving fund" but also should supply to the requesting agency's appropriations, he said.

The provision for contract cancellation without penalty on 30 days notice should be eliminated "or–the multiyear leasing program will not accomplish its purpose," Biddle said.

Lessor Files Suit Against IBM Charging Leasing Monopolization

DALLAS – Reynolds Computer Corp. has charged in a federal suit that IBM is attempting to monopolize the market for leasing and selling IBM equipment "in an effort to destroy [Reynolds'] business and remove it as a competitor."

Reynolds, which leases and sells IBM equipment, is seeking $345,000 in damages.

"We consider the charges to be completely without merit and will defend ourselves vigorously against them," an IBM spokeseman stated.

Reynolds alleged IBM has been providing "markedly inferior" service on equipment purchased or leased through Reynolds although all IBM equipment is to be maintained under identical contracts.

This poor maintenance has resulted in the machines' continual malfunctioning, Reynolds claimed, adding these malfunctions have been directly attributed by IBM personnel to the fact that the equipment was obtained from Reynolds.

"Such action on the part of . . . IBM coerced and intimidated [Reynolds'] customers into leasing or purchasing all of their data processing equipment directly from IBM for fear that if they purchased or leased from Reynolds their equipment would not be properly maintained," the brief filed in the U.S. District Court for the Northern District of Texas stated.

In addition, Reynolds claimed IBM informed it that users who obtained their equipment from the leasing company would receive no free systems support.

Potential Reynolds customers were told that even if they decide to pay for such systems support, it would be provided only on an "as-available" basis, while IBM customers received it free of charge and on a priority basis, according to the suit.

Potential customers were further informed they would be denied free technical support, would no longer be invited to attend IBM seminars and would be removed or excluded from the IBM customer list "even though they leased or purchased other equipment from IBM," the brief said.

IBM has until Sept. 1 to formally answer the charges.

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THE CREATIVE COMPUTER PEOPLE

ITC, Ready to Make Own Tape, Has No Plans to Enter Market

By Molly Upton

Of the CW Staff

NEW YORK – Information Terminals Corp.'s (ITC) new tape production plant is making tape on an experimental basis and the firm expects to start using its production runs in about three months, Reid Anderson, ITC president, said in an interview here recently.

The firm constructed the plant in order to assure control over its media as much as for cost savings, Anderson said.

Currently the firm pays for the use of an outside product line where tape is made to its own specifications.

It will continue this practice in order to ensure backup, Anderson said. However, despite the fact the tape is made to ITC specifications, the firm has to throw away a lot of it, he added.

ITC, which makes several kinds of floppy diskettes as well as cassettes and is a licensee for the 3M cartridge, should grow about 50% during 1976, "but that's not big growth for us," he observed, since in the year ending in June revenues will have grown from $6.7 million to about $12.5 million.

The firm has no plans to enter the 1/2-in. tape market. "It looks like we can use all we make," he said.

Overall, the magnetic media markets are slowing down their rate of growth, he said, adding the cassette especially is leveling off.

There was a time when the industry could not fill all the media orders, probably because customers were double ordering attempts to ensure delivery, he said.

The 3M cartridge is "getting to be a very important product," Anderson said, adding ITC is the only licensee.

The pricing on floppies has been going down slightly, "more than we'd like to see."

IBM last winter instituted a quantity discount on its floppies and is getting competitive on large orders, he said.

ITC is shipping more of the IBM-type soft-sectored diskettes, but the hard-sectored market, while not growing, is not fading away, he said.

ITC is still privately held. For some time it has been looking at the possibility of merging or going public but is in no hurry, Anderson said, adding he would like ITC to be a little larger before making any such moves.

"The public market is better, but still not good," he said.

Ampex Executive Level Dissolves

REDWOOD CITY, Calif. – Multiple moves have taken place at Ampex Corp. with at least one attributed to a corporate refocus on the importance of video products into the field of data technology.

The resignations and changes came in what a company spokesman termed "effectively unrelated areas" and have resulted in the disappearance of an executive echelon.

Others attributed the moves to "an internal political battle between the old group and the new group."

Stanley Mantell, head of the Data Products Division, resigned and was replaced by Charles Steinberg, vice-president of the Audio-Visual Systems Division. Steinberg will head both divisions as vice-president, Audio-Visual/Data Products, as part of a corporate "consolidation."

The move, according to the Ampex spokesman, highlights corporate philosophy that video products will be more influential in data technology in the future.

Also in the Data Products Area, Al Gaudie, controller, was shifted to the corporate side and replaced by David R. Bunker.

In addition, Tom Harleman, head of marketing for the division, resigned and was succeeded by David Chapman.

On the corporate side, Sam Goodman, vice president and chief financial officer, resigned "to pursue interests of his own."

Lou Fried, head of corporate data processing, also resigned. Ben Ballard has taken over the position as manager, corporate management information systems.

Survey Finds 99% of Respondent Banks Using DP

PHILADELPHIA – A recent survey found 99% of all respondent banks were involved in DP and 88% have converted or are in the process of converting to on-premise operations.

Laventhol & Horwath, an international public accounting firm, surveyed the 617 largest U.S. commercial banks, ranked by deposits, and received nearly a 33% return.

The greatest use of outside DP services has been and will continue to be in the area of "preprogrammed packages" for such applications as consumer loans, installment credit, payroll and personal trust, the survey found.

While 36 vendors were named as applications packages suppliers, six vendors accounted for 74% of all packages purchased. They included Florida Software Services, Inc., University Computing Co. (UCC), Management Science America, Inc. (MSA), Kranzley & Co., First Wisconsin National Bank of Milwaukee and Centurex Corp.

Eighty-nine vendors were named as suppliers of contract program services, with seven firms accounting for 38% of all supplied services. The leaders were Florida Software Services, IBM, MSA, UCC, Centurex, Kranzley and Warrington Associates, Inc.

72% to Buy Applications

In the future, 72% of the banks plan to purchase application packages, 25% to continue in joint development, 15% to contract for programming and 8% to contract for facilities management.

Competition from thrift institutions and regulatory changes have had dramatic effects on the banking industry's DP research and development approaches and expenditures, the survey also found.

"Competitive pressure has resulted in all major banks using their data processing departments in their marketing efforts," the report stated.

"All the new techniques used to attract customers, such as electronic funds transfer systems (EFTS), interest-bearing checking accounts and consolidated customer statements, depend heavily on DP.

"This increased usage made it necessary for these departments to engage outside services for DP research and development to supplement in-house operations.

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1. Japan will continue to increase imports of foreign-manufactured EDP equipment at the rate of 30% per year through 1977. In 1977, total Japanese DP imports will exceed $1 billion per year.
2. The U.S. share of the Japanese import market is 55%. This should remain constant, although in previous years the U.S. share has reached as high as 70%.
3. Minicomputer sales in Japan are expected to chart a phenomenal 60% annual growth rate through 1977.
4. Independent peripheral equipment purchases are expected to rise 44% in this period.

Shukan Computer is the best-read computer publication in Japan... *Shukan Computer* is *Computerworld*'s sister publication for the Japanese market. It's a joint venture between *Computerworld* and Dempa Publications, the leading electronics publisher in Japan. *Shukan* is the only weekly newspaper for the Japanese DP community, and it's clearly emerging as the leader among the Japanese readership. *Nihon Kezai Shimbun* ("Japan Economic Journal"), which is regarded as the "Wall Street Journal" of Japan, recently conducted a readership study of computer users in Japan – and found that *Shukan*'s readership rating is twice as high as the nearest competitor, *Computopia*, and more than three times higher than the third-place *Joho Sangbun Shimbun* ("Information Industry Newspaper").

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As Difficult as Small Demand

Large-Demand Mart a Challenge to DG

NEW YORK – "Marketing in a marketplace of excessive demand is as challenging a management task as marketing in a marketplace of too little demand, although the disciplines of the two situations are quite different," according to Herbert J. Richman, marketing vice-president at Data General Corp. (DG).

Recently the firm has experienced both, he said here recently.

Both orders and shipments are running very strong.

"We saw orders stretch out our lead times earlier this year" and the factory is now in the process of catching up.

"Lead times for many products are more reasonable for our customers today than several months ago, although there is more yet to be done to reduce them," he observed.

"Eclipses can now be shipped in 60 days, Nova 2s in 90 days, and Nova 3s in 90 to 120 days. That should tell one something of the very strong incoming order rates for those OEM computers," Richman added.

The Micronovas will be shipped starting this fall.

"It's too early to assess Micronova acceptance, and it is not likely to become a major share of volume in 1977, but we like the direction it takes us in the market," he commented.

Lead Times

"We have found no evidence of losing business because of excessive lead times, however, since most of our competitors have experienced the same kind of stretch out in lead times.

"End users of these computers usually expect shorter lead times than many OEM customers. Thus, we have worked to reduce the Eclipse cycle," Richman said.

"However, Nova 3 lead times are still longer than we would like for our OEMs, and we hope to reduce them in the next few months," he said.

"The balance of orders and shipments is one of the things to manage carefully in times of strong demand," he added.

"We also try to choose business during these times that matches our own resources. For example, if Nova 3 lead times are uncomfortably long for some customers, we direct greater selling attention to shorter cycle products, such as Eclipses and Nova 2s.

"Most of our salesmen are trained in the entire product line and have been successful in switching product selling emphasis rather quickly. The commission structure naturally helps them shift gears," Richman said.

More Selective Selling

"We also try to be more selective in the kinds of business we go after. The difficult or complex or pioneering kind of customer or application may not be the one we can tackle in these times.

"We have worked hard to find profitable business in the past, since it is one of the basic criteria for us being in business.

"In today's marketplace we believe we are being even more successful at this search," Richman said.

"One result of this kind of market is the increased productivity of our sales people. We are unable to bring new trained salesmen on stream at the rate of incoming orders.

"And the commission system of motivating our field people tends to accelerate order rates in this kind of market," he said.

"This situation also suggests a lot about our pricing and concession tactics, which have never been known for being liberal.

"It is frankly beyond me how one can reduce prices in a market of excessive demand unless he has a problem he probably should have fixed another way," he said.

"Finally, the current demand situation makes us assess regularly our plans for product introductions," Richman said.

This situation leads one to several conclusions about the current marketplace:

- There may be more demand than anyone has resources to meet.
- Competitive actions, such as pricing, new products, new applications, are likely to have little impact on the forward movement of anybody, unless a very specific segment is targeted.

DG has been doing more thinking about its longer term planning as a company. It has been restructuring its marketing organization for some time so the market planning process can mature and become more orderly, he said.

Vice-president of North American sales, Dick Weber "essentially relieves me of the day-to-day job of managing the sales function so I can devote more attention to overall management," Richman said.

U.S. Firms to Show Products in Kuwait

ATHENS, Ohio – A multi-industry exhibit for U.S. firms is scheduled to take place in Kuwait Nov. 20-26.

The fair, American Expo-Kuwait 76, will be held in the Kuwait Hilton and Massila Beach Hotel and will include communications equipment and computers.

"As the Arabs industrialize and their systems become more complex, demand for computers will increase," according to Azmi D. Mikhail, president of Overseas Financial and Investment Services, Inc. "Governments will remain good sales targets since they are among the more complex institutions.

Further information on the exposition is available from Mikhail at P.O. Box 36, Athens, Ohio 45701.

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Simpler Products Seen Needed in Remote Computing

By D. Curtis DeForest

Special to Computerworld

WOODBURY, N.Y. – Recent Calldata surveys of present and potential users of remote computing services all seem to point in one direction: Markets for remote computing can be substantially broadened if customers can be provided with simpler products/services and personalized service.

Potentially, every business with $500,000 or more in annual sales can profit from some kind of remote computing if the service bureaus can come up with improved personalized service and simpler products.

The customer's desire to see better personalized service, incidentally, is somewhat puzzling to me: The very concept of a service bureau implies personalized service. The only explanation that can be offered here is that perhaps we, as an industry, have been guilty of not being fully responsive to the variety of customer requests. One way to improve this situation is through applications support. More will be said about it later.

Our best-selling products are those where a customer does not have to learn something drastically new by switching to remote computing.

The potential mass user of remote computing is a small business whose managers have neither time nor desire to learn some complicated programming scheme that eventually might prove helpful.

Product simplicity implies overall service simplicity: programming, presentation of results (printout), pricing of service, communication with computer, etc.

Product Simplicity

In developing any new market, product simplicity and ready usefulness are the key.

Continuing the tradition today of forcing the customer to learn computer jargon simply won't do if the huge potential markets for remote computing are to be tapped.

Fortunately, hardware and software technology today is at the point where English-language programming can easily be the rule rather than an exception.

It is technologically feasible for service bureaus to offer simpler products.

Application programs can be written with front ends in the jargon of each discipline (application) rather than in some "universal" pigeon English.

Litigation Syatem

Can this be done economically? Calldata has several applications programs like this in its library, one of which is an automated litigation management system called Leximatic.

It was developed by recognizing that a defending lawyer in a typical litigation suit frequently has to retrieve the required information quickly and completely.

The major constraint during the development of the system was to make it readily usable by a lawyer or his staff without any computer training.

The logic of the system and the physical handling of the documents are those of the index-book approach familiar to most lawyers.

Through a terminal, the lawyer has access to all documents not only by any single descriptor, but by any combination of descriptors.

This system is an example of an attempt to meet the need of a customer without the complexity and inconvenience of learning some "simple" computer jargon.

It took some effort to develop, and internally it is a rather sophisticated program. But externally, and this is where the program interfaces with the user, it is simplicity itself.

Our experience with this and other truly simple products indicates a very high degree of customer acceptance and satisfaction.

Consequently we feel that opening up of new "nonsophisticated" markets must be done with products that are at least as simple.

Price Value, Not Cost

Product simplicity will not only help open up new markets, but it may automatically solve (simplify) our present problem of pricing a remote-computing service.

It should be remembered that, in the final analysis, a typical user is really interested in something like "How much will it cost me to prepare X number of paychecks (purchase orders, tags, labels, monthly statements, etc.) i.e., how much will it cost me to prepare each check?"

Before the advent of simple systems, a typical service bureau was forced to charge on the basis of artificial units like "system hour," "resource unit" and other equally puzzling (to the user) terms.

This process can and should be simplified for the user.

Getting Personal

To provide users with a truly personalized service, it appears good results can be obtained through the use of a marketing organization comprised of four branches: sales, technical support, customer service and applications support.

The sales branch has an obvious function: selling the service to prospective users.

The technical support branch should be responsible for all technical problems that might come up. A person should be available on a short notice both for visits and for telephone consultation.

The customer service branch should be responsible for all nontechnical problems such as interfacing the customer and the bureau's operations staff and aiding the customer with installation of various equipment.

The fourth branch – applications support – is practically nonexistent in most bureaus today.

It should be responsible for assisting customers with their applications. People staffing this branch should be specialists in businesses served by the bureau.

The overall simplicity of remote-computing service implies the ability to satisfy one's computing needs by dealing with a single service bureau.

Indeed, by dealing with just one vendor, the user gets the benefit of a single invoice, one set of rules and procedures, simpler liaison.

At the same time, it is a truism that different applications, for best cost/performance, should be done on different machines and/or in different computational modes.

Of course, there is more to the overall computing service than just product simplicity and personalized service like security (software and physical).

Other factors include: response time, reliability and backup, availability of on-line and off-line storage, systems time availability, availability of immediate telephone assistance and others.

But product simplicity, with all its implications, will be crucial in broadening the mass markets in the late '70s and '80s.

DeForest is vice-president of Calldata Systems, Inc.

Executive Corner

ARMONK, N.Y. – Bart M. Stevens, formerly president of IBM's Office Products Division, has been elected an IBM senior vice-president and appointed a member of the firm's Corporate Management Committee.

Stevens, who will also head the corporate operations staffs, succeeds Warren C. Hume, who has retired after nearly 37 years.

James J. Foreses, formerly assistant group executive of IBM's General Business Group, succeeds Stevens as president of the Office Products Division.

■ Dr. A.D. Berk has been appointed vice-president of engineering and O. Lynn Gilmore has been named vice-president and general manager, Micromega, for Bunker Ramo Corp.'s Electronic Systems Division.

■ Three people have been named vice-presidents at National Sharedata Corp. Mark Smylie, John French and James M. Paolozzi have taken charge of management services for the corporation's Memberbank Marketing Group, the new Systems Marketing Group and the firm's Los Angeles data center, respectively.

■ Peter C. Waal has been named vice-president of systems development of Telenet Communications Corp.

■ Tom F. Jahn has been named president of Facit-Addo, Inc., with responsibility for the firm's U.S. operations.

■ Richard N. Spann has been named vice-president of development of Adage, Inc.

■ Rex R. Hollis has been named vice-president of marketing of Southern Pacific Communications Co.

■ Robert E. Sundius has been elected corporate vice-president and David J. Barber has been elected vice-president of software development of Mohawk Data Sciences Corp.

■ William T. Burgin and Michel R. Bailleul have been elected to the board of directors of Compuscan, Inc.

■ William E. Huber has been appointed vice-president of marketing of Genisco Computers, a division of Genisco Technology Corp.

■ Carroll A. Pedigo has been appointed vice-president of Scientific Software Corp.

■ William I. Bauer has been elected vice-president and director of health programs and William J. Veigele has been elected vice-president and director of the Resource Sciences Institute of Kappa Systems, Inc.

■ Anna Tipton has been elected corporate vice-president of Advanced Computer Techniques Corp.

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September, 1976

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PROGRAMMER/ANALYST

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COMPUTER PROFESSIONALS

SEI is a growing data processing service and consulting firm providing system analysis, evaluation, and development services to an expanding group of midwest and national organizations, both in industry and government. SEI works primarily with OS/VS systems, but with attention also to other systems and manufacturers.

SEI has openings for dedicated professionals who work hard, who seek challenges and who welcome diversity. The openings are primarily for work in the metropolitan Chicago area, but a willingness to travel is an asset.

PROJECT MANAGER

With general responsibility for one or more consulting projects for a client, the Project Manager identifies system and data processing problems, defines their solutions, and supervises their implementation. The Project Manager assigns and supports technical personnel, and works directly with client personnel providing training and guidance services, and serving as a primary communication link between client and project personnel. The Project Manager is expected to identify problem areas and client needs.

Applicants should have a bachelor's degree (or equivalent) and 10 years of significant professional experience, including programming, system analysis, and project management. Applicants must have demonstrated supervisory skills, the ability to deal effectively and constructively with clients and technical personnel, and the ability to handle concurrent, competing tasks and to allocate scarce project resources. Salary: $23,000 - $33,000.

STAFF MANAGER

A Staff Manager directs a team of 8 - 12 consultants and programmers, and guides their ongoing professional development. Team members are assigned, individually and in groups, to a variety of technical projects. The Staff Manager provides continuity, direction, training, and guidance, through one-to-one support, and by conducting formal and informal workshops on programming languages and skills. The Staff Manager assists in recruiting technical personnel, and in the development of technical standards and practices.

Applicants should have a bachelor's degree (or equivalent) and 10 years of data processing experience over a wide range of applications, including analysis, programming, project management, and operations. Programming experience should include at least three widely used programming languages. Three years of teaching or management experience is necessary. Training or experience in personnel management is helpful. Salary: $27,000 - $37,000.

SOFTWARE SPECIALIST

The Software Specialist is a top-notch programmer and analyst who can take vague descriptions of program products desired, and carry them through all phases of design and development, including documentation. The Software Specialist works on the design and implementation of proprietary software, client projects, and complex application problems. The Software Specialist provides technical support and user guidance, and assists in training new personnel.

Applicants should have a bachelor's degree (or equivalent) and 10 years of technical experience with involvement in Assembly Language, two high-level programming languages, two large-scale computer operating systems, and two application areas. Three yeras of experience must relate to system internals and low-level hardware usage. Excellent analytic and programming skills are expected, plus thorough knowledge of computer operating systems and applications. Salary $23,000-$33,000.

Salaries are flexible depending on the applicant's abilities and experience. An excellent benefit package is provided. Send detailed resume and salary requirements to:

SEI computer services

450 East Ohio Street
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Attn.: Jane Hesse

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Major International Airline, returning to its New York Headquarters, is seeking to restaff its Data Processing area. Programmer Analysts, Project Leaders, Systems Analysts & Mini-Computer experts are sought to work in our 370/158 OS/VS-2 & PDP-11 state-of-the-art environment.

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Our needs are immediate. We would appreciate only responses from professionals who are genuinely interested in a career change.

Reply in strict confidence:

V.P. Data Processing
CW Box 4721
797 Washington St.
Newton, Mass. 02160

Programmer Analyst

The Center For Naval Analyses Wants To Hire A

FINANCIAL SYSTEMS PROGRAMMER/ ANALYST

Requires Bachelor's Degree in Accounting or Business Administration plus 1-3 years of programming experience in administrative or financial systems. FORTRAN experience is essential and some experience with COBOL desirable.

Duties include: Systems design, programming, installation and maintenance of management information systems, primarily financial.

This is an outstanding opportunity for the qualified individual to have responsibility for the design and programming of a financial information system.

Send resume's to:

THE CENTER FOR NAVAL ANALYSES

1401 Wilson Boulevard
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Programmers

The University of New Mexico Computing Center in Albuquerque has openings for the following positions:

Applications Programmer

Knowledge of IBM, OS, JCL and at least 2 high level languages (FORTRAN, COBOL, PL/2 or assembler) required. Successful applicant must have at least one year experience as a programmer. Bachelor's degree or equivalent in experience. Starting salary range: $8,674 - $11,253.

Sr. Applications Programmer

Knowledge of IBM, OS/MVT, JCL and at least 2 high level languages (FORTRAN, COBOL, PL/1 or assembler) required. Must have at least 2 years experience as a programmer. Bachelor's degree or equivalent in experience. Experience as a lead programmer desirable. Starting salary range: $9,568 - $12,251.

Sr. Systems Programmer

Generate, maintain, modify, document and consult (All on OS/HASP). Assembler language and 2 high level languages required. Bachelor's degree or equivalent in experience plus 3 years systems programming experience. Knowledge of 360 architecture. Starting salary range: $14,123 - $17,784.

The University of New Mexico is located in the heart of the "Land of Enchantment". Although it is among the least densely populated states, New Mexico boasts a richly textured heritage in 3 major cultures - Indian, Hispanic, and Anglo. These traditions still flourish and are explored through the gamut of artistic endeavors from the Santa Fe Opera to the numerous galleries and craft shops in Santa Fe and Taos. The enchantment of the arts is second only to the land that inspires and informs them. New Mexico's excellent climate graces the raw beauty of the moonlit desert and the alpine meadows in the mountains. And in winter, the numerous ski slopes make New Mexico a land of year round enjoyment.

Send resume and salary requirements to: Director of Computing Center, University of New Mexico, Albuquerque, New Mexico 87131

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SYSTEMS PROFESSIONALS

CNA, an imaginative and innovative insurance organization is installing a $26 million IBM 370 computer system that will be the most modern in the insurance industry and seeks several key systems professionals. We prefer individuals who are dedicated to career advancement and desire to be involved in the development of state of the art systems and applications. We operate in a MVS 158MP/168MP, IMS, TSO, RJE environment and seek:

SYSTEMS CONSULTANTS AND ANALYSTS

At least 3-5 years of systems experience in an Insurance or Financial Services business.

In these positions we prefer you have experience in Management Information Systems or Insurance Processing Systems for Casualty, Personal or Commercial Lines. You should also be able to communicate effectively with all levels of management and systems personnel.

SENIOR PROGRAMMER/ANALYSTS

Experience in implementation of an on-line Life Insurance Processing Systems. The ideal applicant will possess in-depth Life Insurance experience, with emphasis on Policy Holder Service or Actuarial and a strong technical background which includes proficiency in BAL, COBOL and OS-JCL.

DATA BASE/DATA COMMUNICATIONS ANALYST

Practical experience with IBM equipment, data base processing capabilities and IMS access methods. You'll provide technical support to application development and operations areas in their use of IMS. The ability to provide design support in the data base and/or data communication areas of IMS is essential.

We offer an excellent salary plus generous benefits and relocation assistance for these positions in our modern and convenient Chicago loop headquarters. For immediate consideration, please send your resume with salary history to Employment Manager.

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Systems Programmers

Allegheny Airlines has immediate openings for systems programmers with experience covering a broad area and levels in system design. Minimum requirement BS degree and 1 year experience on IBM hardware supporting SVS/HASP/TSO systems.

Computer Operators

Immediate openings for computer operators with a minimum of 1 year experience on IBM Systems/370, OS/VS-VM/HASP or PARS. Must be willing to work shifts.

We offer excellent salary commensurate with skills, ability, and experience, company-paid benefits, and free or reduced rate travelling privileges for you and your immediate family members. Our data processing center is located in suburban Arlington, Virginia. If interested and qualify for either of the above positions, please mail resume and salary history in confidence to Employment Services, Allegheny Airlines, Washington National Airport, Washington, D.C. 20001. Equal Opportunity Employer M/F.

ALLEGHENY

Engineering

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Hardware specialist needed to maintain a large mini computer system. Experience in trouble shooting from system to chip level a must. Degree optional. Salary commensurate with ability. Comprehensive benefits. Call Ms. O'Keeffe (212) 868-6433.

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Director of Data Processing

A small liberal arts college in Upstate New York is seeking a Director of Data Processing who will be responsible for the development and coordination of the data processing function for both the academic and the administrative uses of the computer.

A Bachelor of Arts degree required (MBA a plus) with three to five years experience in data processing, preferably in a college environment. Programming knowledge in RPG and Fortran is required, General Automation experience desirable. Applicant must possess good communication skills both verbally and in writing. Salary level is $15-18,000 with excellent benefit program. Send resume to: CW Box 4725, 797 Washington St., Newton, Mass. 02160.

PROGRAMMER/ANALYST

Philadelphia institution located in Center City is seeking an experienced Teleprocessing Programmer/Analyst. Candidate should have a minimum 2 years CICS experience working with large scale IBM equipment. OS a must, PL/I helpful. Good benefits. Send resume in confidence or call:

Mr. Wiegel
(215) 972-7061
Community College
of Philadelphia
Computer Center
34 S. 11th Street
Phila., Penn. 19107
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Intercomm Systems Programmer

U.S. Energy Research and Development Administration in Albuquerque New Mexico is seeking a Systems Software Programmer with a minimum of 2 years' experience in OS/MVT and minimum of 1 years' experience as INTERCOMM Systems Programmer. Work involves maintaining INTERCOMM system tables and writing and maintaining local modifications to INTERCOMM. Experience with COBOL programming desired. ASSEMBLER programming is necessity. Salary $16,255 to $20,678. Please send resume to Stephan G. Buswell at: U.S. Energy Research and Development Administration, P.O. Box 5400, Albuquerque, N.M. 87115. *An equal opportunity employer.*

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Are you a Systems Analyst or Programmer/Analyst looking for high visibility and substantially increased responsibility in a rapidly expanding data processing installation?

We are a large teaching hospital located in the suburbs of a major Mid-Western city. Hospital administration is making a significant new commitment to developing computerized systems in all areas of health care. Our ability to meet that commitment depends on the recruiting of top flight data processing professionals.

If you are interested in joining a quality staff, on the forefront of computer technology and applications design, in the industry exhibiting the fastest data processing growth rate, we want to hear from you. Our is a fast-paced environment affording an excellent opportunity to learn while you make a real contribution. Salaries are more than competitive for the right individuals.

Keys to this unique opportunity are 2-5 years data processing experience, demonstrable systems development successes, good communications skills, and project leader potential. Health care systems experience and a college degree are highly desirable.

Responde in confidence to:

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797 Washington Street
Newton, Mass. 02160

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If you have a broad computer aided design background in an electronic development/manufacturing environment and have a strong desire to provide technical leadership as a career goal we would be interested in talking with you.

We are planning to implement an integrated system which will provide a fully automated process to aid the design and manufacturing areas with computer aided support facilities. Major duties will be defining the system architecture and implementation.

The individual we seek should have an EE or CS preferably at the advanced degree level, with several years of solid background in computer aided design, large software systems, data base design, and high-level language concepts. This technical-professional position offers a rare opportunity for the individual who has a proven record of accomplishment in a leadership role of computer aided design.

We offer an excellent starting salary along with a full fringe benefit package. Confidential resume outlining experience, education, responsibilities, and salary requirements should be submitted to:

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Ideally you should have a COBOL background and/or assembler experience, preferably in a manufacturing and/or financial environment. Requires a minimum of one year experience and demonstrated ability in programming and/or systems design.

Send your resume, including salary history and location preference in strictest confidence to: Mr. William Smith, Corporate Management Systems Development, B-3, Rockwell International, 2135 West Maple Road, Troy, Michigan 48084.

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Software and Systems

NCR's Point-of-Sale Division in East Central Ohio has grown considerably in just three-and-a-half years. Our Engineering facility alone has increased from 100 to nearly 400 employees. This growth suggests a high degree of satisfaction with the kind and level of work being performed. Moreover, the fact that just about all of them are still with us also indicates they are pleased with the living environment this open, rural area offers them and their families.

The Point-of-Sale Terminal Systems is an expanding market for the computer industry and, accordingly, highly competitive. To maintain our lead position in the field, we require the talents of experienced Systems Engineers and Software Engineers with mini and microprocessor exposure. We invite you to send your credentials, including your area of work interest, for consideration.

Software Systems

Software Systems Engineers will define and develop overall total systems level software architecture required for future terminal control systems. This will include operating system software, system level simulations, system level diagnostics, and communications including in-house digital links and common carrier networks.

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All terminal software development in the new generation of P.O.S. terminals is performed by the software design groups. They also develop the support software for these new terminals. Working in a small team atmosphere you will become an immediate contributor to the software product.

Knowledge and/or experience in Assembly Language programming; mini microcomputers, and exposure to at least one of these areas — operating, I/O, communications or system test software design — are essential. In addition, experience with Procedural Language programming, software system integration and testing will be helpful.

Systems Engineers

They will define the requirements of real-time micro/minicomputer systems — both the hardware and software. This entails the conceptual design, performance analysis, design support and critical design tradeoffs.

The more senior computer professional will bring from 2-10 years experience in the systems or software areas; the entry level candidates will bring sound knowledge of the areas indicated in support of their inquiries.

We invite you to contact us at your earliest convenience for placement consideration.

Robert W. Donovan
Terminal Systems Division
NCR Corporation
P. O. Box 728
Cambridge, Ohio 43725
Phone: 614/439-0398

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SYSTEMS PROGRAMMING

LIBRARY SYSTEMS SPECIALIST

The Pennsylvania State University is seeking a person to assume primary analysis responsibility in the position of Library Systems Specialist, available immediately. Responsible to the Director of Systems Development. Responsibilities include research, planning, implementation, and testing; coordination and management of the analysis staff; comprehensive project documentation.

Minimum qualifications: Bachelors or masters degree or equivalent in appropriate field, four to five years project related experience with medium and large scale time-share computer systems and/or significant experience in large university or special libraries.

Send application together with vita to Paul M. Gherman, Personnel Librarian, 505 East Pattee Library, The Pennsylvania State University, University Park, PA 16802. Application deadline: August 15, 1976.

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SYSTEMS DEVELOPMENT
SYSTEMS MAINTENANCE

We have a number of new and challenging opportunities involved with the development and maintenance of application and operating systems. Our company is a fast-moving carpet manufacturing, distribution and retail operation currently grossing 85 million in annual sales. Our plans for the future include heavy emphasis on development of on-line real-time financial, manufacturing and distribution systems. We presently have openings in our Management Information Systems (MIS) Department for the following individuals:

COMPUTER SYSTEMS DESIGNER
(SYSTEMS ANALYST)

Applicants should have a bachelor's degree in mathematics, computer science or one of the scientific or systems disciplines, plus a minimum of 3 - 5 years experience designing and programming business computer application systems. Competence in Cobol, IBM System/370, DOS-VS, CICS-VS and Power-VS is required.

COMPUTER SYSTEMS DESIGNER/PROGRAMMER
(PROGRAMMER/ANALYST)

Applicants should have a bachelor's degree in mathematics, computer science or one of the scientific disciplines, plus a minimum of 2 - 3 years experience programming business computer application systems. Competence in Cobol, IBM System/370 and DOS-VS is required.

OPERATING SYSTEMS TECHNICIAN
(SYSTEMS PROGRAMMER)

Applicants should have a bachelor's degree in mathematics, statistics, computer science or one of the related scientific disciplines, plus a minimum of 3 years experience designing and maintaining operating software for an IBM System/370 with DOS-VS, CICS-VS and Power-VS. Competence in Cobol and on-line real-time systems, both local and distributed, would be a plus.

All positions above require individuals of unusual academic and personal quality. Our MIS staff is comprised of bright, aggressive systems professionals whose dedication to their tasks is reflected in major information efforts throughout all operating units of our company. Please send your resume in strict confidence to:

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Director of Management Information Systems

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If you've been solving computer system software problems for at least five years and can point to at least three to five years of solid line management experience in a pre-sale and post-installation customer software support capacity, we can offer you a chance to move out. And up.

We need managers who have the desire, experience, and ability to manage our teams of crackerjack software support professionals and the tact to interface effectively with management of other functional areas.

You will select, recruit, train, motivate, and develop the right people to make a highly effective support organization pay off.

If you make the move, you'll be working for a well-known, aggressive minicomputer manufacturer in either New York City, San Francisco, Los Angeles or Boston.

Send your resume, complete with salary history, in confidence to

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CSC

PROGRAMMERS

Computer Sciences Corporation, one of the world's largest information sciences companies, has opportunities available for software professionals in the Northern Virginia area.

We are currently seeking expertise in the following areas:

- Military Communications systems development. Experience with 360/370 ALC required.
- Real-time applications. Experience on the H316, 516, or 716 using Assembly Language.
- Military Information Systems applications. Requires experience on the H6000 using Fortran and COBOL.
- Data base management systems. System 2K development experience desired with opportunities to gain experience with other major data management systems.

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Please send resume in confidence to:

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Coordinator of Time-Sharing Services

Westarn Illinois University has an immadiate opening for an MICC Coordinator. MICC (Mid-Illinois Computer Cooperative) is a cooperative time-sharing network serving 5 major Illinois universities. Duties include consulting with students and faculty concerning software problems, conducting user training seminars, developing new applications, and representing WIU at Coordinator meetings. Minimum requiremants include a bachelor's degree in Mathematics, Statistics, Computer Science, or a closely related field (master's degree preferred), expert knowledge of several languages (FORTRAN a must), working knowladge of applied statistics, experience with time-sharing, and 2-3 years of related axperienca, preferably in a university environment. Knowledge of SPSS and CDC hardware and software a plus.

This is a 12-month, administrative position. Salary to $18,000.

Send resume and referances to: Mr. Tate Lindahl, Computer Center, Western Illinois University, Macomb, Illinois 61455, (309) 298-1177.

Deadline for applications: August 27, 1976

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For prompt consideration, please send your complete resume including salary history and raquiremants to: Ray Leszczynski

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Finance Director is seeking an individual to set up a City Data Processing Division. Initial task will be to identify for transfer a municipal finance package for use on an IBM System 3/15 oparated by a local service bureau. Service bureaus ara currently handling water/sewer billing, tax billing, parking violations and payroll.

Requiremants: B.S. degree in Computer Science or math or equivalent experienca and training. Background in operation of data processing systems, programming techniques and municipal data systems desired including supervisory axperience.

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Make a good living where the living is good. There's no question—living is good in the Dallas area. Our public school systems have earned national recognition for excellence. We're one of the fastest growing areas in the nation, yet our housing dollar stills buys considerably more home in Dallas than it would in most other metropolitan areas. We're surrounded by lakes, and blessed by beautiful weather year 'round. We back professional, university, and high school athletic teams, and we support our symphony, theaters, the civic opera and several museums. But, best of all, most of us are down home friendly people.

Product Software Programmers

We're looking for outstanding programmers. People who can step into lead and associate positions to interface special purpose hardware with computers in real time state-of-the-art systems. Requires 5 to 10 plus years experience in the production and test of product software for real time/near real time/process control or data base management applications. Special emphasis will be placed on experience with IBM 370 assembly language under OS/MVT and 16 bit mini-computers ALC. Experience with the production of product software to support electronic systems in government procurements is highly desirable.

Software Systems Acceptance Test Engineers

Positions are open for Test Engineers with 2 to 10 years experience in the formal acceptance testing of software systems. This experience should include the development of test concepts, test plans, formal test procedures and test software. Experience in conducting formal acceptance tests and the analysis of test results is highly desirable. Positions are open for personnel with IBM 370 software testing experience as well as 16 bit mini-computer software testing. Real time experience desirable but not necessary.

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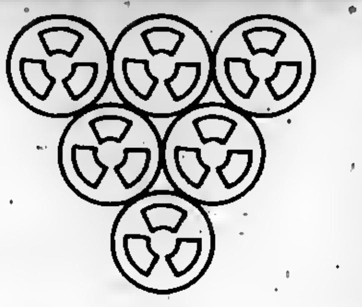

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CDC Net Climbs in Quarter, Six Months

MINNEAPOLIS – Control Data Corp.'s computer business earnings continued to climb in the second quarter and six months while earnings from Commercial Credit, its finance and insurance subsidiary, declined.

The firm's earnings reached 511.6 million or 67 cents a share in the quarter ended June 30 compared with a restated $9.3 million or 55 cents a share in the same quarter last year.

In the quarter, computer business earnings rose to $2.8 million from a loss of 5601,000 in the same period last year, while Commercial Credit's earnings declined to 58.8 million from $9.9 million.

Computer business revenues climbed to $335.1 million compared with $299.4 million a year ago. Outright sales totaled $168.2 million compared with $135.2 million in the same period last year.

During the half year, CDC earned $21.7 million or $1.25 a share compared with $20.1 million or $1.20 a share in the year-ago period.

Of this, the computer business contributed $3.6 million compared with a $110,000 loss in the same period last year.

Commercial Credit's earnings dropped off to almost $18.1 million from $20.2 million.

Six-month computer business revenues reached $641.7 million compared with $581.4 million in the first half of last year. Sales totaled $314.9 million compared with $264.2 million in the same period last year.

Earnings of Commercial Credit in the second quarter were reduced by a $758,000 foreign exchange charge and by adverse claims and benefit costs in the insurance segment of the business, the firm said.

Burroughs Income Up 8.5%

DETROIT – Burroughs Corp.'s net income for the second quarter rose 8.5% to a record $42.5 million or $1.05 a share on revenues of $464.3 million.

Net income in the year-ago period was $39.1 million or 99 cents a share on revenues of $416.8 million.

Net earnings for the six-month period were $66.7 million or $1.66 a share, a 7% increase over the 1975 earnings of $62.5 million.

Estimated U.S. and foreign income taxes for the six-month period were $45.9 million, compared with $50.3 million in the year-ago period. The lower effective tax rate, due to foreign-exchange tax benefits, was responsible for much of the net income increase, according to a company spokesman.

Worldwide incoming orders in the first six-month period increased 22% over last year's first half, Ray W. Macdonald, chairman, said.

Burroughs views the remainder of 1976 and the year 1977 optimistically, Macdonald said, because of the outstanding customer acceptance of the newly released products, including the B4800/3800 medium to large systems and B80 small system.

Acquisitions

EG&G, Inc. has agreed in principal to acquire Identicon, Inc. Plans call for an exchange of 50,000 shares of EG&G common.

Automatic Data Processing, Inc. (ADP) has sold its publishing business, Science & Medicine Publishing Co., Inc., to Harcourt Brace Jovanovich, Inc. for an undisclosed consideration. The unit had operated at a modest loss for the nine months ended March 31, ADP said.

Tymshare, Inc. has agreed in principle to acquire Unitax, Inc. for about 144,000 shares of common on the basis of one share for each four of Unitax common. Both firms supply computerized tax return services.

Vanier Graphics shareholders have approved plans for the merger of the firm with American Business Products, which is expected to be effective June 30.

Perkin-Elmer Corp. has completed its merger with Wangco, Inc. in an exchange of nine-tenths of a share of Perkin-Elmer common stock for each share of Wangco common.

Pertec Corp. has agreed to acquire Icom, Inc., maker of microprocessor-based subsystems for microcomputers.

Western Union Corp. has acquired Telstat Systems, Inc. through a pooling-of-interests merger for a share-for-share exchange resulting in the issuance of about 875,000 shares of Western Union common stock. Telstat will become an operating division of the Western Union Teleprocessing Group.

Alanthus Corp. has acquired the Leasco Data Communications Corp. subsidiary of Reliance Group for $3 million cash and $1.25 million subordinated convertible notes.

System Development Corp. has acquired certain assets and contracts of Moll Associates, Inc.

Computer Usage Co. has acquired the San Francisco Data Center of Greyhound Computer Corp.

Tymshare, Inc. has agreed in principle to acquire Simplified Data Processing Systems, Inc. for 35,400 shares of Tymshare common stock.

Harris Corp. has acquired the M&M Computer Industries, Inc. division of The Singer Co. for an undisclosed amount of cash.

Automatic Data Processing, Inc. has acquired the brokerage services division of PCS Data Processing, Inc. and had also acquired Information Sciences, Inc.

Memorex Triples Earnings in Quarter

SANTA CLARA, Calif. – Memorex Corp. more than tripled its income before extraordinary credits in the second-quarter to $6 million or $1.04 a share.

This compared with income before extraordinary credits of $1.3 million or 28 cents a share in last year's second quarter.

Net income for the second quarter of 1976 was $9.1 million or $1.59 a share. This included an extraordinary credit of $3.1 million or 55 cents a share from utilizing tax loss carryforwards.

Revenues for the second quarter soared to $80.8 million, an increase of 23% over the comparable 1975 period.

Revenues for the first half also saw a sharp rise. They were reported at $160.2 million, an increase of 26% over revenues of $127.2 million for the first half of last year.

For the first six months of 1976, income before extraordinary credits was $11.3 million. An extraordinary credit of $6.9 million from utilizing tax loss carryforwards brought the net income to a total of $18.2 million.

For the similar period of 1975, income before extraordinary credits was $2.3 million, with credits from a loss carryforwards and debenture purchase totaling $5.4 million.

Itel Reports Record Six Months

SAN FRANCISCO – Itel Corp. reported record net income and revenues for its second quarter and six months, with second-quarter per-share income up nearly 100% from the comparable period.

For the second quarter, net income was $3.3 million or 50 cents a share, a 94% increase over 1975's second-quarter income of $1.7 million or 25 cents a share.

Revenues for the quarter were $63.3 million compared with $42.7 million a year ago.

For the six-month period, Itel reported net income of $6 million or 91 cents a share, a 58% increase over 1975's income of $3.8 million or 53 cents a share.

Revenues for the six months were $119.4 million, compared with $80.9 million for the first half of 1975.

...Toward the Bottom Line

Centronics Data Computer Corp. has declared a dividend of 15 cents a share payable Sept. 6 to holders of record Aug. 6. This represents a 50% increase over the previous quarterly dividend.

$ $ $

Milgo Electronics Corp. has been approved for listing on the New York Stock Exchange.

$ $ $

DPF has signed a $30 million revolving credit and term loan agreement with four banks led by the First National Bank of Boston.

$ $ $

Computer Optics has signed a lease financing agreement with North American Corp. providing for the purchase of up to $5 million in terminal systems.

$$$

T-Bar, Inc. has arranged a $1 million loan from the Prudential Insurance Co., to retire existing debt and for use as working capital.

$$$

Technology Management, Inc., a financial consulting and systems development firm, has changed its name to TMI Systems Corp.

$$$

LRC, Inc. has finalized a $1 million expansion of its debt resources with the placement of an aggregate of $500,000 of subordinated debentures to Central Investment Corp., MorAmerica Capital Corp. and Electro-science Growth Investments.

$$$

National CSS, Inc. has completed a $3.8 million medium-term debt financing with Northwester National Life Insurance Co. The proceeds are being used to finance a portion of the purchase price of an Amdahl Corp. 470/V6 acquired in June.

$$$

IBM has announced a third-quarter dividend of $2:25 a share, payable Sept. 10 to holders of record Aug. 11. This represents a 50 cent increase over the last dividend.

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Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg. Jackson, MS, 39202, up until 2:00 p.m. 8-23-76 for the following data processing equipment:
Request for Proposal No. 257 for the lease or purchase of a remote batch terminal capable of communicating with a Univac 1106 system.
Request for Proposal No. 258 for the lease or purchase of a marksense input device capable of communicating with an IBM 370 Model 155 over telephone facilities.
Request for Proposal No. 259 for the lease or purchase of a minicomputer and floppy disk system to be used to monitor and record results of psychology lab experiments.
Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

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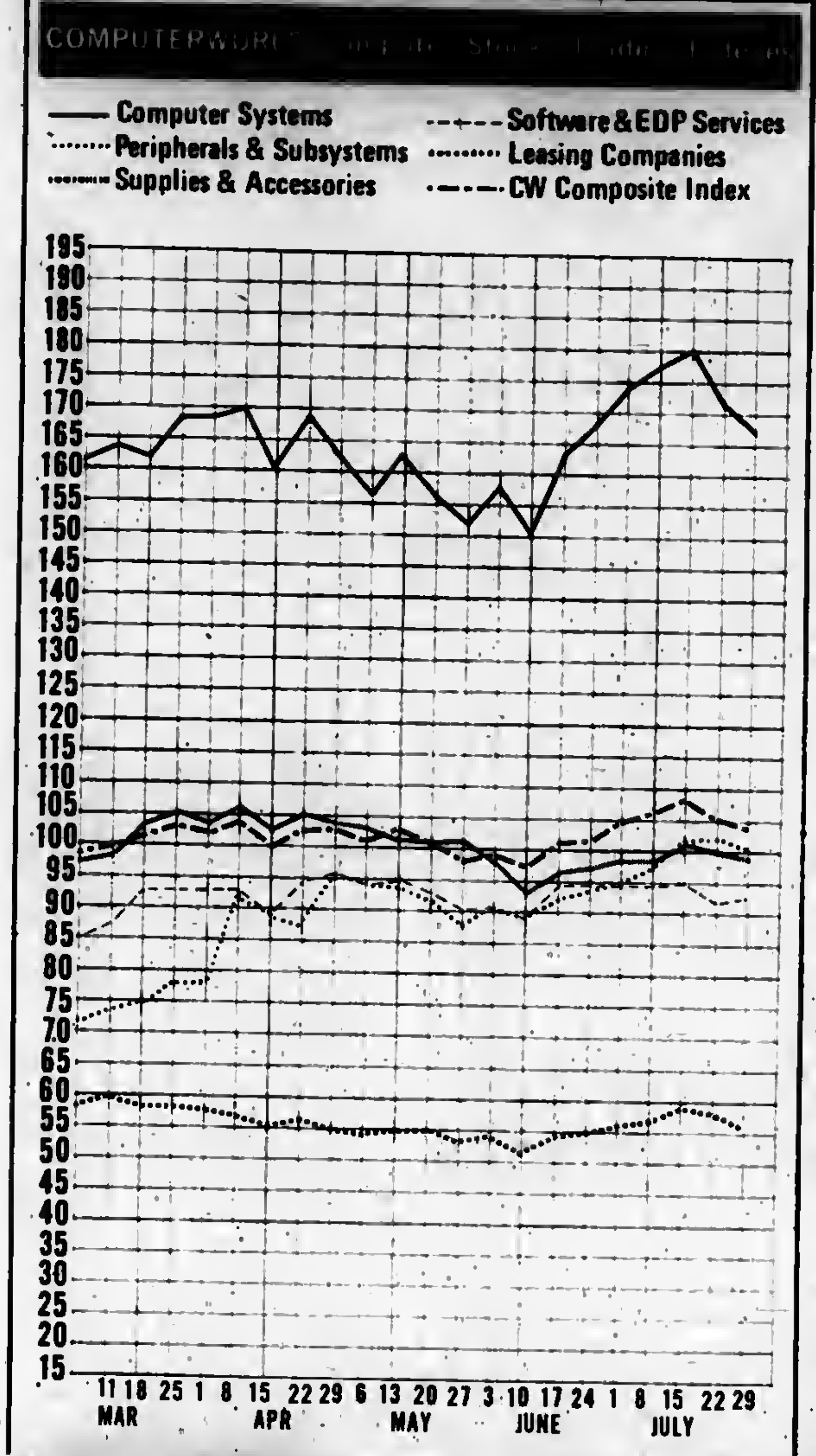

Earnings Reports

ELECTRONIC TABULATING

Three Months Ended March 31

	1976	1975
Shr Ernd	$.24	$.16
Revenue	839,458	751,287
Earnings	102,896	65,923

KEANE ASSOCIATES

Three Months Ended March 31

	1976	1975
Shr Ernd	$.06	$.06
Revenue	1,278,000	1,135,000
Earnings	48,000	52,000

LEWIS BUSINESS FORMS

Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.21	a$.36
Revenue	7,674,000	9,039,000
Earnings	301,000	517,000

a-Adjusted to reflect five-for-four stock split on April 30, 1975.

MANUFACTURING DATA SYSTEMS

Three Months Ended Feb. 29

	1976	1975
Shr Ernd	$.15	$.13
Revenue	3,655,000	2,784,000
Earnings	377,000	285,000
6 Mo Shr	.29	.20
Revenue	7,251,000	5,181,000
Earnings	735,000	444,000

ADDRESSOGRAPH-MULTIGRAPH

Three Months Ended April 30

	1976	a1975
Shr Ernd	$.26	$.12
Revenue	146,580,000	145,989,000
Earnings	2,088,000	978,000
9 Mo Shr	.45	.34
Revenue	415,294,000	429,195,000
Earnings	3,650,000	2,760,000

aRestated to reflect change in accounting method for foreign currency translations.

ANALOG DEVICES

Three Months Ended May 1

	1976	1975
Shr Ernd	$.30	a$.23
Revenue	9,755,023	7,456,278
Earnings	474,858	346,593
6 Mo Shr	.56	a.40
Revenue	18,323,438	14,745,310
Earnings	878,293	592,989

a-Adjusted to reflect 5% stock dividend in March 1976.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 28, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE 111	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
M	BURROUGHS CORP	84-108	95 3/4	-5 1/2	-5.4
O	COMPUTER AUTOMATION	10- 19	16 1/4	- 5/8	-3.7
N	CONTROL DATA CORP	18- 27	23 1/8	- 3/4	-3.1
M	DATA GENERAL CORP	40- 60	51 1/4	-1 3/4	-3.3
O	DATAPOINT CORP	24- 46	38	-4	-9.5
O	DIGITAL COMP CONTROL	2- 7	6	- 1/2	-7.6
N	DIGITAL EQUIPMENT	138-181	170	-1 1/4	-0.7
N	ELECTRONIC ASSOC.	2- 5	2 7/8	- 1/8	-4.1
A	ELECTRONIC ENGINEER.	7- 16	9 3/4	+ 1/8	+1.2
N	FOXBORO	28- 46	43 3/4	+ 3/8	+0.8
O	GENERAL AUTOMATION	5- 11	6 3/8	+ 1/8	+2.0
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
M	HEWLETT-PACKARD CO	95-117	109	+1 1/4	+1.1
N	HONEYWELL INC	34- 56	47 3/8	-1 1/4	-2.5
M	IBM	227-280	273	+2	+0.7
O	MANAGEMENT ASSIST	1- 3	2 1/8	- 1/8	-5.4
O	MEMOREX	18- 33	26 1/2	- 5/8	-2.3
O	MICRODATA CORP	10- 27	24	+ 1/4	+1.0
O	MODULAR COMPUTER SYS	9- 14	11 1/4	0	0.0
N	NCR	24- 36	33 1/8	- 1/8	-0.3
O	PRIME COMPUTER INC	4- 14	14	+1 1/2	+12.0
N	PERKIN-ELMER	19- 27	22 1/8	-1 1/8	-4.8
M	RAYTHEON CO	45- 66	60 1/2	-2 1/4	-3.5
M	SPERRY RAND	40- 52	46 3/4	-1 1/2	-3.1
O	SYCOR INC	20- 31	23	- 3/4	-3.1
A	SYSTEMS ENG. LABS	6- 10	8 1/2	- 1/2	-5.5
N	VARIAN ASSOCIATES	13- 17	14 1/2	- 1/2	-3.3
A	WANG LABS.	11- 20	15 1/2	- 5/8	-3.8

LEASING COMPANIES

EXCH		1976 RANGE 111	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/4	- 1/4	-3.3
A	COMMERCE GROUP CORP	2- 3	2 7/8	- 1/8	-4.1
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	+ 1/8	+7.6
M	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	-	-9.1
M	DPF INC	5- 8	7 1/8	- 3/8	-5.0
A	GREYHOUND COMPUTER	3- 8	7 1/4	- 1/8	-1.6
N	ITEL	6- 15	13 5/8	- 1/8	-0.9
M	LEASCO CORP	6- 19	15 1/2	+ 3/4	+5.0
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	MRG INC	0- 1	1/2	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/8	- 3/8	-4.8
N	U.S. LEASING	7- 12	10 1/4	- 1/8	-1.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH		1976 RANGE 111	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	0	0.0
O	AMACOMP INC	8- 11	8 3/8	- 1/2	-5.6
A	APPLIED DATA RES.	2- 4	3 3/4	+ 1/8	+3.4
N	AUTOMATIC DATA PROC	17- 35	33	- 1/8	-0.3
O	COLEMAN AMERICAN COS	3- 6	3	0	0.0
O	COMPUTER DIMENSIONS	3- 7	5 1/4	+1 1/4	+31.2
O	COMP ELECTION SYSTMS	5- 9	6 1/2	- 1/2	-7.1
O	COMPUTER HORIZONS	1- 2	2	0	0.0
O	COMPUTER NETWORK	2- 6	3 1/4	- 1/8	-3.7
M	COMPUTER SCIENCES	4- 8	6 5/8	- 1/4	-3.6
O	COMPUTER TASK GROUP	1- 1	1 5/8	+ 1/2	+44.4
O	COMPUTER USAGE	3- 6	2 7/8	- 3/8	-11.5
O	COMSHARE	2- 9	7 1/2	- 1/2	-6.2
O	DATA DIMENSIONS INC	2- 4	3	0	0.0
O	DATATAB	1- 1	7/8	- 1/8	-12.5
M	ELECTRONIC DATA SYS.	12- 16	13 1/8	- 3/8	-2.7
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 3/4	+ 1/8	+7.6
O	IPS COMPUTER MARKET.	1- 2	1 3/8	+ 1/4	+22.2
O	KEANE ASSOCIATES	2- 4	3 3/8	0	0.0
O	KEYDATA CORP	3- 5	2 1/2	0	0.0
O	LOGICON	4- 4	3 1/2	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/4	+ 1/4	+12.5
A	NATIONAL CSS INC	13- 25	21 3/4	0	0.0
A	ON LINE SYSTEMS INC	18- 22	18 5/8	- 1/4	-1.3
N	PLANNING RESEARCH	3- 5	3 3/4	0	0.0
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2	- 1/2	-20.0
O	REYNOLDS & REYNOLDS	13- 21	17 3/4	+ 1/2	+2.8
O	SCIENTIFIC COMPUTERS	1- 1	1/2	0	0.0
O	TYMSHARE INC	19- 28	25 3/8	- 1/8	-0.4
A	URS SYSTEMS	3- 5	4	+ 1/4	+6.6
M	WYLY CORP	2- 7	2 3/4	- 1/4	-8.3

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE 111	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 3/4	- 5/8	-6.0
O	ADVANCED MEMORY SYS	4- 10	7 7/8	- 3/8	-4.5
M	AMPEX CORP	5- 10	8 5/8	- 5/8	-6.7
O	ANDERSON JACOBSON	2- 4	2 3/4	0	0.0
O	APPLIED DIG DATA SYS	13- 25	22 1/4	-1 1/4	-5.3
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/8	- 5/8	-7.1
A	BOLT,BERANEK & NEW	7- 11	9 1/2	- 1/8	-1.2
N	BUNKER-RAMO	5- 10	8 7/8	- 1/8	-1.3
A	CALCOMP	4- 7	5 3/8	- 1/4	-4.4
O	CAMBRIDGE MEMORIES	0- 6	3/8	-1	-72.7
M	CENTRONICS DATA COMP	20- 36	31 3/8	-1 3/4	-5.2
O	CODEX CORP	22- 42	32	0	0.0
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	4 1/2	+ 3/4	+20.0
O	COMPUTER CONSOLES	4- 7	5 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER TRANSCEIVER	1- 3	1	- 1/4	-20.0
O	CONTEN	4- 9	8	- 1/2	-5.8
M	CONRAC CORP	20- 25	23 3/4	0	0.0
O	DATA ACCESS SYSTEMS	1- 4	3 1/4	0	0.0
O	DATA 100	7- 13	8 1/8	- 5/8	-7.1
A	DATA PRODUCTS CORP	5- 14	13	0	0.0
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC	1- 2	1 3/4	- 1/4	-12.5
O	DECISION DATA COMPUT	1- 4	2	+ 1/8	+6.6
O	DELTA DATA SYSTEMS	1- 1	1	+ 1/8	+14.2
M	ELECTRONIC M & M	1- 3	3	0	0.0
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
M	HAZELTINE CORP	4- 12	9 1/2	+ 1/8	+1.3
M	HARRIS CORP	34- 52	51	- 1/4	-0.4
A	INCOTERM CORP	9- 20	10 1/8	-1 5/8	-13.8
O	INFOREX INC	3- 7	3 7/8	0	0.0
O	INFORMATION INTL INC	10- 18	11 3/8	-1 1/2	-11.6
O	INTEL CORP	60-109	63	-4	-5.9
A	LUNDY ELECTRONICS	4- 7	4 3/8	- 1/4	-5.4
O	MSI DATA CORP	3- 7	6 7/8	0	0.0
A	MILGO ELECTRONICS	15- 21	18 1/2	0	0.0
M	MOHAWK DATA SCI	3- 9	7 7/8	- 1/2	-5.9
O	PENRIL CORP	1- 3	1 7/8	- 1/8	-6.2
A	PERTEC CORP	3- 8	5 3/4	- 1/4	-4.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTOR CORP	4- 6	5	- 1/4	-4.7
O	RECOGNITION EQUIP	6- 11	8 5/8	+ 1/8	+1.4
M	SANDERS ASSOCIATES	6- 11	9 5/8	- 1/8	-1.2
O	SCAN DATA	2- 4	2 1/4	- 1/8	-5.2
O	STORAGE TECHNOLOGY	9- 13	11 7/8	- 5/8	-5.0
O	T BAR INC	5- 10	5 3/4	- 1/4	-4.1
O	TALLY CORP.	4- 6	4 3/4	- 1/2	-9.5
O	TEC INC	3- 5	3 3/4	+ 1/4	+7.1
N	TEKTRONIX INC	45- 67	66 1/4	0	0.0
M	TELEX	2- 5	3 5/8	0	0.0
O	WANGCO INC	11- 22	21 1/8	- 1/8	-0.5
O	WILTEK INC	2- 2	2 7/8	+ 1/8	+4.5

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE 111	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	4- 5	3 1/2	0	0.0
A	BARRY WRIGHT	6- 10	8	+ 1/4	+3.2
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	30- 42	30	-1	-3.2
O	DUPLEX PRODUCTS INC	15- 24	15	+ 1/2	+3.4
M	ENNIS BUS. FORMS	6- 8	6 3/8	- 3/8	-5.5
O	GRAHAM MAGNETICS	8- 13	9	0	0.0
O	GRAPHIC CONTROLS	13- 19	14 1/2	- 1/4	-1.6
M	3M COMPANY	53- 65	59 7/8	+1 3/8	+2.3
O	MOORE CORP LTD	40- 51	40 1/2	-1 3/4	-4.1
M	NASHUA CORP	11- 17	16 1/4	+ 1/8	+0.7
O	STANDARD REGISTER	15- 19	15 1/2	+ 1/4	+1.6
O	TAB PRODUCTS CO	5- 11	10	- 1/2	-4.7
N	UARCO	21- 25	21 1/2	0	0.0
A	WABASH MAGNETICS	4- 8	7 1/2	0	0.0
N	WALLACE BUS FORMS	19- 25	20 1/4	- 1/4	-1.2

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices

© 1976 by Computerworld, Inc.
August 9, 1976 Vol. X, No. 32

NEWSPAPER

UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
ANN ARBOR MI 48103

At ICCC

FCC Chief Calls Policy 'Conscious Flexibility'

By Ronald A. Frank
Of the CW Staff

TORONTO – The current policy of the Federal Communications Commission (FCC) toward data communications is one of "conscious flexibility," with the commission relying on the economic and technical judgments of the marketplace, according to Richard E. Wiley, FCC chairman.

Speaking at the opening session of the Third International Conference on Computer Communication (ICCC) here last week, Wiley said this policy approach is being applied in such areas as the selection between packet and circuit switching, between satellite and terrestrial transmission media,. between general-purpose and specialized networks and between different terminal devices.

'Inevitable Competition'

Rather than referring to "contrived competition," it would be more appropriate to talk about "inevitable competition," the FCC chairman told the conference attendees.

This competition is inevitable because in the postindustrial era there are growing numbers of specialized applications of telecommunications that can improve people's standard of living and there are a growing number of firms and individuals with ideas and products to satisfy those needs, Wiley said.

If current FCC policies were to be characterized in a single word, that word would be "freedom," Wiley indicated.

(Continued on Page 6)

Datapac Debuts Using Nonintelligent Units

TORONTO – The Canadian Datapac data communications network is operational and will begin serving customers within the next few months.

The inaugural demonstration was held here last week by Bell Canada and officials of the Trans-Canada Telephone System during the International Conference on Computer Communication (ICCC).

The demonstration of the intelligent packet-switching network included nonintelligent terminals connected to the network via a network interface machine (NIM). The terminals transmitted data at speeds of 300- to 1,200 bit/sec to the Toronto Datapac node.

From this node, messages were transmitted at 9,600 bit/sec to an IBM

(Continued on Page 4)

New Definitions Proposed

FCC Renewing Computer Inquiry

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has initiated a second Computer Inquiry to update its original 1971 decision and apply current definitions to the boundary between data communications and data processing.

In approving a second inquiry, the commission said distributed networks in which CPUs and terminals are performing both data processing and "communications control applications" had been one of the developments "tending to cause a blurring" between the two major areas.

Users are finding it cost-effective to remove some of the computing power from the DP center and distribute it to terminals or incorporate this power "into the network itself," the FCC noted.

Under proposed amendments to its earlier Computer Inquiry decision, the commission issued a more specific definition of data processing and also proposed eliminating the concept of hybrid service. Interested users and others are being urged to comment on the FCC proposals.

Data processing would be defined "as the use of a computer for the purpose of processing information wherein (a) the semantic content, or meaning, of input data is in any way transformed, or (b) where the output data constitute a programmed response to input data."

Provisions for Carriers

Under the proposed changes, common carriers would be allowed to use DP for "network control and routing," which would include message and circuit switching, speed and code conversion, pulse format conversion, error detection and correction, analog-to-digital and digital-to-analog conversion, signal processing and time division multiplexing.

Carriers would also be able to use DP for input/output processing, which would include using a computer in a network to make different types of CPUs and terminals compatible with each other.

Carriers would be barred, except through separate subsidiaries, from providing "arithmetic processing, word processing or process control." The separate subsidiaries could engage in "general commercial accounting, payroll, inventory control, banking and point-of-sale processing, financial and econometric modeling, scientific calculations, etc."

Word processing as defined by the commission includes "interactive information retrieval systems, management information systems, text editing, translation, typesetting, etc."

Under process control, the FCC would include applications where a CPU is used "to monitor and control some process which is occurring continuously," such as generating stations and automatic ma-

(Continued on Page 4)

File Match-Up Uncovers $250,000 Welfare Fraud

By Catherine Arnst
Of the CW Staff

NEW YORK – After a computer match-up of welfare rolls and payroll lists, the Bronx district attorney ordered the arrests of 42 state and city employees for allegedly collecting $250,000 in fraudulent welfare payments over a three-year period.

Twenty-nine were arrested late last month; the others are still being sought. The mass arrests were made partially "to emphasize a point," District Attorney Mario Merola said.

"If [state and city] agencies would make a simple check of their employee rolls by running the names and Social Security numbers through the welfare computer, these rip-offs would be brought to an immediate halt," he said.

The arrests originally stemmed from anonymous tips received by Merola's office and the Human Resources Administration (HRA). A check was made on the HRA's IBM 370/158 to see whether each person was actually working for the state or city and simultaneously collecting welfare.

None Previously Arrested

The amounts collected illegally by the 42 charged with larceny ranged from $1,500 to $24,000 each, Merola said. None of those arrested had criminal records.

Ironically, one source noted, the arrested employees are in low-salaried positions and some would have been eligible for welfare if they were heads of households and had applied for the funds. The top salary in the group was $9,500.

Since January, 80 public employees have been arrested with the computer match-up method, Merola said. About 90% of the arrests resulted in convictions, according to Det. Salvatore Giunta, head of the Welfare Fraud Bureau of the district attorney's office.

Giunta stressed that if each public agency ran a check with the Welfare Department's computer whenever a new employee was hired, welfare fraud could be cut down enormously. "A good 80% of welfare fraud is concealed employment," he estimated.

"When the Police Department submitted 500 employee names, they came up with 50 cases of fraud," he said. All the district attorneys' offices check new employees through the computer match-up system when they are hired, he said.

In the first seven months of 1976, $11 million was saved by stopping welfare fraud with this method, HRA said. After making such a match-up in November 1975, the department cut off assistance to 1,505 cases and reduced payments in 726 cases.

UK Omits DP Experts in Group Created to Frame Privacy Laws

By Joseph Hanlon
Special to Computerworld

LONDON – The Home Secretary has announced the makeup of the Data Protection Committee (DPC) – and not one computer expert was named to the body mandated to frame legislation for controlling data banks.

While one member of the computer industry was included, his appointment has only added to the controversy surrounding the DPC appointments. He is John Hargreaves, IBM's director of public affairs in the UK and an ex-member of MI5, the military intelligence branch concerned with counterespionage and countersubversion in Britain.

Hargreaves thus has links with two of the organizations which cause the most public concern on the privacy front, critics of the DPC appointments have charged.

In addition, they pointed out, only two members have any involvement with data banks, and that primarily on a management level.

One industry observer commented that, with the current makeup of the DPC, "the Home Office got its own way. The members are all people to whom government pressure can be applied.

"I can't see *that* committee putting pressure on any government department, yet that is just what is needed," he added.

The only member of the DPC with a privacy background is Paul Sieghart, who was brought in from outside the govern-

(Continued on Page 4)

DG Shows Nova 3 Capable of Running Simultaneous Tasks

By Esther Surden
Of the CW Staff

SOUTHBORO, Mass. – Data General Corp. (DG) upwardly expanded its Nova 3 family last week with the introduction of the 3/D, a minicomputer which it said features a 32K-word MOS memory board and the ability to run dual operations.

Also introduced was the Dasher family of 30- and 60 char./sec terminal printers.

The Nova 3/D, which can support up to 128K words of memory, uses "fundamentally the same CPU" as the earlier Nova 3 models, a spokesman noted.

The system is compatible with Nova-line software and peripherals, he added, and application programs can be run on it

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. **W. Germany:** Computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex. 5215350. **Asia:** Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141 Phone: (03) 445-6101 Telex: 26792

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy. $15 a year in the U.S.; $23 a year for Canada and PUAS, all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106, Phone: (313) 761-4700.

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Proxmire Decries FCRA Limitations...

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The only law that comes close to protecting individual privacy in the consumer marketplace is the Fair Credit Reporting Act (FCRA) – and even this law is inadequate for today's world, Sen. William Proxmire (D-Wis.) told the Privacy Protection Study Commission at hearings conducted here last week.

The hearings, which culminated many months of examining recordkeeping practices in the private sector, focused on the firms whose product is personal information – the credit, investigative and commercial reporting companies.

"The activities or organizations engaged in consumer reporting cut across the entire fabric of American society," David Linowes, comission chairman, pointed out in his opening remarks.

"Virtually everyone who has applied for any type of credit, loan, life or automobile insurance, has been considered for certain types of employment or applied to rent an apartment has been the subject of a consumer report," he said.

Information recorded and communicated about an individual may range from minimum identifying data to the most intimate details of personal, physical and behavioral characteristics, Linowes added.

Privacy violations resulting from misuse of such sensitive information are compounded by the increasing computerization and centralization of these files and the matter bears careful scrutiny, according to Linowes.

No Prior Notice

Under present law, consumers receive no prior notification that reports will be prepared about them and only in the case of investigative reports – those that involve personal contact with friends and neighbors – is the consumer even told that a report has been or may be prepared, Proxmire told the commission.

Further, he said, present law requires that a consumer be advised of the identity of the reporting agency which supplied a report upon which he was denied credit, insurance or employment.

But denial of benefits or higher rates for those benefits are not the only adverse actions that a consumer report may precipitate, and the FCRA leaves those possibilities untouched, he said.

Earlier testimony before the commission showed "many life insurance companies make their decisions based on reports supplied by the Medical Information Bureau, even though that bureau's own bylaws prohibit such reliance. Here is one clear case where consumers are being affected by reports they may never know have been made," he said.

Further, although some are beginning to provide copies of files to consumers, the present law only requires agencies to disclose the "nature and substance" of that file, he said.

If the consumer wishes to challenge the information in his file, he may do so, but the reporting agency is not required to tell him of this right or of his right to file a written statement which must be included in subsequent reports, Proxmire added.

The senator also noted that under one of the compromises in the original FCRA, a consumer need not be told in advance of signing a credit or insurance application that such a report is being prepared. The consumer may be notified three days later and, if he wants more details at that time, the report user must disclose only "the nature and scope of the investigation," he said.

Questions Asked

Among the questions asked by one of the largest investigative agencies for auto insurance investigations is: Is the applicant "active in any clubs or church groups or does he have any hobbies?"

It also asks about "criticism of home environment, associates, character or morals, parents or other members of the family, and how the applicant's spare time is spent," Proxmire said.

Finally, when medical information is to be gathered about a consumer in connection with an application for insurance, the consumer must sign an authorization form. This form is a blanket OK for any doctor or medical institution to release the consumer's medical history to the company, he said.

Shouldn't the consumer know that data may also be used in connection with reinsurance, job promotion or workman's compensation matters? Proxmire asked.

Shouldn't the consumer know that data may also be used in a case history for medical study in the training of physicians or to compile official reports to supervisory agencies, peer review or malpractice situations, or may be reviewed for death or disability claims? he added.

Nothing in the present law requires that individuals be told of these future uses or of the recording of their medical histories in the medical information bureau for use in connection with future insurance applications, Proxmire said.

"Businessmen need information about their customers in order to make sensible, sound decisions about credit, employment and insurance."

But, he indicated, it is equally clear that consumers are entitled to a measure of control over the collection and distribution of information about them.

"The fact that reporting agencies may 'own' [an individual's] physical report does not give them unqualified control over its contents or its use," he stated.

Wants Action Soon

Proxmire, who supports extending consumers' privacy protection which was "modestly" provided for by the FCRA of 1970, would like to see action in this area even before the commission makes its final report next year.

The Senate Banking, Housing and Urban Affairs Committee, which he chairs, has drafted and held hearings on a bill (S. 1840) that would amend that law. But chances are "slim" the bill will reach the Senate floor soon since a policy decision has been made not to take up anything "controversial" until January, he said.

Mandatory Consent Urged

Consumers should have to give their "informed consent" for the collection and distribution of information about themselves, he said.

Few consumers realize that in signing an application for insurance or employment they are consenting to a broad-ranging investigation of their character, morals and lifestyle.

"The individual should be able to know when that information has been used against him and by whom. Otherwise, we give approval to secret decision-making processes which the consumer is powerless to confront or change," he said.

The consumer is also entitled to know that information gathered about him is accurate, complete and relevant to the purposes for which it is used, Proxmire stated.

Further, the credit, insurance or job applicant "should not be subject to slipshod investigative techniques or haphazard data collection, distorted recording, reporting or evaluation methods.

"Finally, insurance actuaries ought to be made to justify their claimed 'need' for subjective and personal information," he added.

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...But Credit Reporters See More Laws Harmful

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Further government efforts to restrict the use of personal information within the credit reporting industry would increase costs to credit reporting agencies and seriously reduce the individual's ability to obtain credit, the Privacy Protection Study Commission was told here last week.

These costs could also drive many small credit reporting agencies out of business and force small merchants to abandon private credit plans in favor of bank cards, credit bureau spokesmen said.

Rep. Jake Garn (R-Utah) supported their view, basing his opinion on "facts revealed during hearings" on proposals to strengthen the Fair Credit Reporting Act (FCRA) conducted by the Senate Banking, Housing and Urban Affairs Committee chaired by Sen. William Proxmire.

Garn, ranking minority member of that committee, articulated a view contrary to that of the committee chairman, who testified the day before.

"Often when Congress passes a law protecting the consumer, it is actually denying the shopper free choice in the marketplace. The cumulative effect of these laws is killing individual initiative and stifling small business," he argued.

Garn urged the commission to answer the questions "who will benefit?" and "who will pay?" before supporting new consumer privacy protection legislation.

The recent banking committee hearings showed Garn the FCRA "is working well," he said.

Consumer Complaints

While it was alleged that 20,000 consumer complaints had been received by the Federal Trade Commission since the FCRA went into effect, only 682 of these could be defined as actual valid complaints; less than 100 of these involved investigative, as opposed to consumer, credit reports and only 343 actual complaints were lodged against credit bureaus, Garn said.

Chief among the complaints cited were "relevancy and the actions taken by credit grantors in denying their applications," he said, adding one said consumers did not have access to information in their files and were therefore denied an opportunity to correct inaccurate information.

Credit industry spokesmen told the commission about a new voluntary program that permits individuals to examine hard copies of their files and even obtain copies to keep in some cases, going far beyond the requirements of the FCRA.

John L. Spafford, president of Associated Credit Bureaus, Inc. (ACB), said ACB's members pioneered this policy. ACB represents 1,800 small credit bureaus in cities with less than 20,000 inhabitants.

W. Lee Burge, president and chief executive officer of Equifax, Inc., formerly Retail Credit Corp., said his firm would begin the practice Oct. 1.

Spokesmen from all the credit bureaus represented at the hearings denied allowing government agencies and law enforcement agencies "unlimited access" to credit bureau file-type information.

Generally provided to enforcement agencies is "a lead" – name, address and employer, according to Spafford. Accordingly, it is against policy to obtain information from law enforcement agencies, the spokesman said.

Other Inquiries

As for other government inquiries, "less than 2% of the average credit bureau's annual volume is accounted for in regular reports to government agencies of all kinds," Spafford said. Nearly two-thirds of that 2% is for mortgage loan reports for the Federal Housing Authority or Veterans Administration, he added.

The other one-third of the 2% goes to various state agencies for granting jobs or professional licenses, which is a "permissible purpose" under the law, Spafford said.

The only legal way for a government agency to obtain credit bureau information not specifically covered in the permissible purposes provisions of the FCRA is through a subpoena issued by a court with proper jurisdiction. This would rule out the use of so-called "pocket" or "administrative" subpoenas, Spafford said.

Defining consumer credit reports as those containing simple factual information about an individual's credit history and investigating reports as those containing "more subjective" information, such as information on lifestyle, sexual preferences and health often gained from third parties, another spokesman for Equifax explained all data included in an investigative report must be confirmed by more than one source.

Information provided by a neighbor that cannot be confirmed, for example, is omitted from the client's report and no "raw notes" taken by investigators during interviews are retained. The individual then sees exactly what the client receives, he added.

While those appearing on behalf of the credit industry were opposed to new legislation, they conceded they could live with several key concepts suggested by the commission.

Among them is the concept that, while the reporting customer should be considered the "owner" of an individual's credit report, the individual should have a right to control its use much like the owner of a copyrighted document.

"One may own a book without having a right to copy and distribute it," Willis Ware, commission vice-chairman, pointed out.

Further, while testifying that they, not the credit grantor, should be the only ones to discuss a report with the individual about whom it was prepared, most agreed the explanation should be in the responsibility of the credit grantor when credit is declined for reasons other than material contained in the report.

After a general presentation by Spafford, Barry Connelly, another ACB spokesman, agreed to translate some of the numbers embodied in ACB's testimony.

ACB members, which produce 100 million credit reports annually, received two million requests for disclosures from the data subjects last year. Of that number, according to Connelly two-thirds, or 1,333,333, were requested after credit was denied, as permitted by the FCRA.

Of that number, 75,000 people inserted statements clarifying their side of disputes between themselves and merchants.

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FCC Inquiry to Probe DP, Communications Boundaries

(Continued from Page 1)

chine tool uses.

The proposed changes eliminate the hybrid service definition which said that services which were primarily communications-oriented but included incidental DP would be regulated and that services which were primarily DP-oriented but included incidental communications would be unregulated.

The proposed rules define CPUs as "general-purpose stored program processors, general- and special-purpose minicomputers and microcomputers." Processing would be defined as "the use of a computer for operations upon data which include arithmetic and logical operations, storage, retrieval and transfer.

These regulations "provide a demarcation between data processing services and communication services. By so defining data processing, we have deleted the 'hybrid service' concept and henceforth a service would be characterized as either data processing or communications," the commission said.

Explaining the FCC's logic behind the proposed rule changes, commission chairman Richard Wiley last week told attendees at the International Conference on Computer Communications in Toronto that "developments in distributed processing, switching and terminal equipment have put a severe strain on the definitions and rules that were laid down in the area of centralized data processing and electromechanical switching."

Wiley described the proposed definition as "a positive definition of data processing" in terms of "what it is rather than by exception, as we have done previously."

By sharply defining the regulatory boundary between DP and communications, technological and marketing developments will be stimulated by removing earlier ambiguities, he added.

In a related action, the FCC said it would call a future planning conference to consider the technological and policy aspects resulting from the convergence of computers and communications. Tentatively scheduled for September, the meeting will be open to the public.

Comments on the proposed rules are due by Oct. 11.

Users who send comments on the DP proposals should refer to "the adoption of proposed amendment to Section 64.702 of the commission's rules and regulations as set forth in Appendix A."

Datapac Demonstrated at ICCC

(Continued from Page 1)

370/168 operating under VM/370 at Bell Northern Research in Ottawa. The CPU included an IBM 3705 front end modified with software to make it compatible with the X-25 packet-switching protocol adopted for use on the Datapac network.

The X-25 standard was implemented using the Standard Network Access Protocol (Snap), which is the Datapac version of X-25.

Various terminals were used in the demonstration, including CRTs and teleprinters. Also demonstrated were the Addressograph Multigraph Corp. Amcat credit authorization terminal and the NCR 280 point-of-sale transaction terminal.

The demonstration included an international interconnection with the French RCP experimental packet-switched network. RCP was described by French officials as the forerunner of the Transpac network that will begin serving French users in 1978.

The three operating RCP nodes in France were interconnected with a fourth node set up at the Toronto Datapac facility for the demonstration. The transatlantic link included a 9,600 bit/sec circuit split into dual 4,800 bit/sec data streams.

As part of the RCP demonstration node, an X-25 interface was programmed onto an Intel system that included an 8K 8080 microprocessor. A Digital Equipment Corp. PDP-11/35 was used as the node processor, according to the RCP representative.

The Datapac network was used to register ICCC attendees. About 1,000 attendees at the conference represented 23 countries, according to David Horton, director of computer communications planning with the Trans-Canada Telephone System, who was conference governor.

About 150 attendees were from foreign points off the North American continent, he said.

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Privacy Unit Omits DP Experts

(Continued from Page 1)

ment to draft the white paper, "Computers and Privacy" [CW, Dec. 31-Jan. 5], which led to the committee's establishment.

Even the government-sponsored National Computing Centre was not represented in the 14 DPC appointments.

The committee was established to advise the government on the control machinery needed to ensure that existing and future systems holding personal information "are operated with appropriate safeguards."

It is also to evaluate "the objectives to be included in legislation" establishing permanent safeguards, according to the Home Secretary's announcement.

The British Computer Society (BCS) criticized the DPC's membership for its lack of technical expertise. The society is said to be "hopping mad" about the appointments.

The BCS is especially upset because the considerable assistance it offered in selecting the DPC membership was rejected. The society put forward the names of more than 25 people actively involved in computers and privacy, none of which were included on the DPC appointements.

This was all the more surprising because the government accepted a BCS offer to study the computer aspects of the controversial 1971 census and published the society's conclusions as an official government report.

The National Council for Civil Liberties (NCCL) has declared that "a majority of the committee consists of people professionally involved in collecting sensitive information about individuals. Only one of its members has a known history of concern for the individual's privacy."

The only DPC members with data bank involvements are Charles Reed, director of the Inter-Bank Research Organization, and Ken Potts, chief executive of Leeds City Council. Leeds is currently building a data bank of information on property and people. Known as Lamis, it is expected to be the basis of systems in several other cities.

In its evaluation of the DPC, NCCL said "it is hard to believe this committee will properly appreciate the urgent need to control the collection and use of confidential information. It is more likely to be obsessed with technical aspects of computer security and the cost of protecting privacy."

According to one insider, much of the DPC membership was selected from the civil servants' list known as "The Great and the Good" – those who have achieved eminence in something and are unlikely to offend the civil service.

The result, he said, is that the committee does not draw on any of the expertise built up in the past six years and will have to start from scratch all over again.

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The Employee Retirement Income Security Act of 1974 effective January 1, [illegible] the recording of all hours worked [illegible] compensated and [illegible] well as all dollars [illegible] employee [illegible]

[illegible] payroll [illegible] including social security [illegible] with [illegible]

FCC Judge Rules AT&T Spin-Off Of Western Electric Unwarranted

By Toni Wiseman

Of the CW Staff

WASHINGTON, D.C. – A Federal Communications Commission (FCC) administrative law judge said last week that AT&T should not have to divest itself of its manufacturing subsidiary, Western Electric Co.

Judge David I. Kraushaar also found that AT&T's long-distance rates are reasonable in relation to its rate of return.

The rulings are part of an ongoing proceeding and came in the form of recommendations still to be considered by the FCC. They constitute a portion of Phase II of the FCC's hearings on AT&T charges and corporate structure begun in 1971 and will probably not be considered until early next year.

The judge's rulings balanced off previous FCC staff recommendations that AT&T be ordered to spin off Western Electric [CW, Feb. 9].

When the FCC began its investigation, it claimed the rate base on which the phone company bases its tariff charges is excessive and should be reduced.

In his opinion, Kraushaar said the "monumental record . ... in this proceeding fully justifies AT&T's continuing existence intact as a quality common carrier that provides excellent telephone service to a very large population."

The "integration" of Western Electric and Bell Laboratories in the Bell System "has provided, and continues to provide, definitive useful public benefits in the form of systemwide expertise and innovations that have, in turn, led to monumental technological advances," he added.

Although the FCC should upgrade its policing of AT&T's rate charges, "the problem of managing Bell's 'bigness' ... simply doesn't call for the altogether extreme and revolutionary remedy of divestment and splinterization in the holy names of 'competition' and 'free markets,' " Kraushaar stated.

Rate of Return 'Reasonable'

Earlier this year the FCC decided AT&T is entitled to a return on its long-distance operates of 9.5% or up to 10% if the extra amount results from efficiencies. The previously authorized rate of return was 8.7%.

Kraushaar found that the over interstate revenue levels of AT&T's various operating companies in relation to overall interstate revenue requirements are "reasonsble and capable of providing rates of return at reasonable levels" previously determined by the FCC.

Kraushaar also found AT&T's long-distance rates and charges are reasonable and just or at least not "unjust or unreasonable discrimination."

The order would also require AT&T to end all restrictions on sales of Western Electric equipment to non-Bell companies and to take steps to encourage Bell companies to buy equipment made by companies other than Western Electric.

Thomas S. Nurnberger, AT&T executive vice-president, said the company was "gratified" with the judge's findings, which he termed "sound."

AT&T has "always been convinced that the research and manufacturing capability built into the Bell organizations benefited telephone customers," he added.

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CMI Reopens After Refinancing

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) has reached agreement in principle with its lending banks on a plan for additional funding.

The funding enabled CMI to resume operations on a reduced scale after closing down for more than a week because of financing problems [CW, Aug. 2].

CMI will sell its equipment now out on lease to an independent company in satisfaction of a debt of about $13 million owed to the lending banks.

The firm will have a contingent liability on the sale of up to $1.5 million on the leased equipment if the revenues from this equipment fail to achieve specified levels.

Nova 3/D Capable of Running Dual Operations

(Continued from Page 1)

without modification. The Nova 3/D runs under the firm's Real Time Disk Operating System.

Designed for the data entry and scientific user and for the small business user through systems houses, the 3/D is a "medium-scale mini," larger than Digital Equipment Corp.'s PDP-11/34 but smaller than the PDP-11/70, the spokesman noted.

The Memory Mapping and Protection Unit (MMPU), added to the Nova 3/D, is the hardware enhancement that allows concurrent batch and multiterminal operations. It performs logical-to-physical address translation, giving user programs access to 128K of memory through four address extension tables, or maps, including two program maps and two data channel maps, DG said.

Memory mapping and protection also permit privileged instructions, I/O device protection, main memory write and validity protection, the spokesman added.

The system can accommodate 700 nsec 16K-, 8K- and 4K-word semiconductor memories and 800 nsec 8K or 1,000 nsec 16K core memories as well as the 32K board.

The 700 nsec 32K memory, introduced for the Nova 3/D, can be used on all Novas. The DG-produced two-layer printed circuit board uses 4K random-access memory (RAM) chips.

An alternate board using Texas Instruments parts is also available, the firm noted.

Modular Terminals

The Dasher terminal printers, though introduced with the 3/D, were designed for use with all of the firm's minicomputers. The terminals, also made by DG, are modular with a "minimal parts count" for reliability, DG said.

The Dasher line consists of four models; both the 30 char./sec unit and the 60 char./sec model come in keyboard send/receive (KSR) and receive-only (RO) versions. All models print 132-column lines.

A single printed circuit board in the printer base contains all interface, control logic and encoder electronics, DG said. Modules for printhead/carriage drive, paper feed, ribbon drive and keyboard array can be easily accessed for service, the spokesman added.

The terminals, which can be used offline as typewriters, feature a lead screw drive mechanism for the printers, he noted.

The terminals are interface-compatible with DG systems and character-compatible with Teletypes and other Ascii input devices, DG said, adding they can be interfaced to 20ma current loop and EIA RS-232C devices using asynchronous controllers or multiplexers.

The standard character set is 128 characters of upper and lower case Ascii. A 96-character European and an Asian character set are available and up to 29 function codes can be optionally added.

Users can field-select upper and lower case format or all upper case format, DG said.

Product Pricea

A typical Nova 3/D configuration with 96K words of MOS memory with parity, MMPU, battery backup, memory parity control, power fall/auto restart, automatic program load, real-time clock, two 10M-byte disks, 300 line/min printer, 75 in./sec magnetic tape drive, 30 char./sec terminal printer and four CRTs costs $86,950.

The processor with 32K words of MOS with parity costs $14,400.

The Dasher Model 6042 30 char./sec KSR terminal costs $2,400; the 6043 RO version costs $2,200. The Model 6040 60 char./sec KSR terminal is priced at $2,650 while the Model 6041 RO unit costs $2,450.

FCC Policy Termed 'Conscious Flexibility'

(Continued from Page 1)

"We are allowing freedom of entry into the data transmission area by new carriers; that customers be allowed to have freedom to connect their own properly certified terminal equipment directly to the lines of established carriers; that entrepreneurs be able to lease basic transmission capacity from established carriers and to tailor that capacity to the specialized needs of their own customers.

"We are giving otherwide unaffiliated users the freedom to share private lines in order to take advantage of special rates or to gain network efficiencies; we are giving subscribers the option of using the international switched voice network for Dataphone service; and finally we are committed to giving the established carriers the freedom to compete fully and fairly in the specialized data communications areas," Wiley said.

'Reasoned Evolution'

Recent FCC decisions fostering competition represent a "reasoned evotution from past policies"; the competition that stems from these decisions is the result of phenomenal changes in electronic technology outside the control of the monopoly carriers and the dissatisfaction of specialized users with the regular services offered by these carriers, he said.

Commenting on the opposition to competitive policies by the established carriers, Wiley said "there is no evidence to suggest that rates for basic telephone service have been perceptibly impacted by the meager amount of competition introduced to date.

"And," he added, "there are adequate remedies available for dealing with any possible prospective adverse effects long before they could occur."

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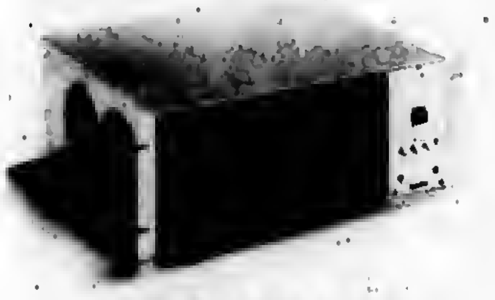

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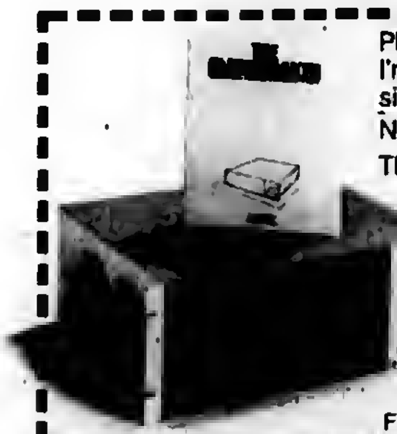

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Problems Cited in Discontinuing SSN as Identifier

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – Discontinuing use of the Social Security number (SSN) as an identifier might prove more difficult for computerized record systems than the drafters of the Privacy Act of 1974 might have expected.

In a recent speech before local chapter members of the Association for Computing Machinery here, Samuel I. Schaen, coauthor of *The Privacy Act of 1974: A Reference Manual*, explained why.

Individuals are not required by law to remember or provide their specialized identification numbers, he said. Thus a cross-reference table based on personal characteristics is needed to identify individuals in record systems, Schaen said.

Second, to transfer information between systems, especially corrections, recordkeepers must be able to identify the same individual in more than one system of records, he said.

Cross-Referencing Problems

In the case of a cross-reference table for individual identification, the Office of Management and Budget (OMB) guidelines for implementation of the Privacy Act of 1974 suggested agencies use a combination of personal characteristics, such as date and place of birth, parentage and so forth, in addition to the individual's name.

This would be relatively simple in a manual system; but would require considerable character string manipulation in a computer system, especially since names are not always precise, Schaen said.

"Individuals will often use shortened forms of their names so that 'Bill Jones,' 'William Jones' and 'William Jones Jr.' may, in fact, refer to the same individual.

"Likewise, a person's birthplace may also be subject to the multiname phenomenon," he said. For example, "'Richmond,' 'Staten Island' and 'New York City' are all legitimate birthplace descriptions for individuals born on that borough/island which is part of New York City.

"With the exception of statistical records, each individual must have a unique identifier for that system to function" or there can be "no guarantee that information will be recorded accurately or be assigned to the proper individual" – another requirement of the act.

Functioning Problem

While it is possible to establish cross-reference tables of personal characteristics as an alternative to unique individual identification, many existing systems cannot function without the presentation of the unique individual identifier used to index the system.

Moreover, a generalized solution to this problem for automated systems could be very costly, he said.

Same Arguments Used Pro and Con

The arguments used to support the concept of a standard universal identifier are the same arguments made against it, he said.

The potential intersystem linking of individual records made possible by a standard universal identifier increase the potential of accumulating comprehensive data files on individuals.

Use of multiple identifiers increase the possibility of erroneous information being propagated uncontrollably or at least uncorrected, he said.

The choice, therefore, is between multiple unique identifiers and a standard universal identifier with other safeguards to prevent abuse.

While generating corrections is costly without a standard universal identifier, it is, nevertheless, possible to do, he said, noting that the objective is for the source agency to convey the identity of the individual in question to the previous data recipient.

The recipient agency, if it maintains a record on that individual, must, in turn, make the prescribed change in its record and then pass the correction along to any other agencies to which it had disclosed the record.

Identifier Eases Association

Certainly the association would be eased if a standard universal identifier were used by both systems, he said.

Agencies barred from using a standard numerical identifier might be inclined to standardize types and formats of the characteristics used, creating a de facto standard and thus defeating the spirit of the law.

A Possible Alternative

As a possible alternative, Schaen suggested the date, time and source of the original transfer of information be maintained by both agencies for use in matching a record.

"There is a very small probability an agency would disclose data for two identically named individuals at the same time," he said. Furthermore, the agency could take steps to assure that such a coincidence could never happen.

The only additional requirement placed on the recipient agency would be an acquisition log or some other indication of when the receipt of the original disclosure occurred. It is here that additional costs and complexity might prove prohibitive, Schaen suggested.

Russians Plan to Use DP To Seek Greener Pastures

MOSCOW – Russian shepherds will be able to determine the best feed routes for their flocks through the use of computers, according to Tass, the Soviet news agency.

Airplanes will provide photographic information about the ripening stages of grasses which the computers will process. The results will be communicated to the shepherds, Tass said.

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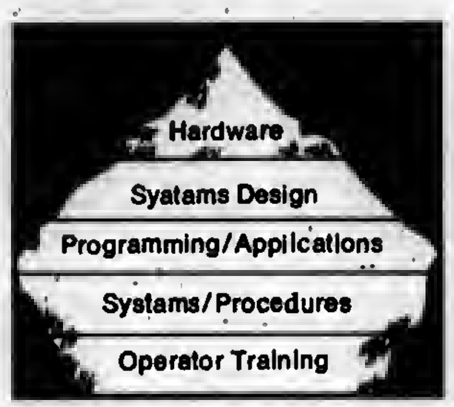

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Afips Elects Williams as President

MONTVALE, N.J. – The American Federation of Information Processing Societies (Afips) has elected as president Dr. Theodore J. Williams, professor of engineering and director of the Purdue Laboratory for Applied Industrial Control at Purdue University.

The Afips Board of Directors also reelected Dr. Albert S. Hoagland as vice-president, Dr. Sylvia Charp as secretary and Walter A. Johnson as treasurer. They assumed office July 1 and will serve for one year.

Williams, a past president of the Instrument Society of America, has served as secretary of the National Computer Conference Board and Chairman of the Afips Special Committee on Membership. He is currently chairman of Technical Committee TC-5, Computer Applications in Technology, for the International Federation for Information Processing.

He has authored or edited 10 books and published approximately 225 technical papers. Before joining Purdue, Williams was senior engineering supervisor in charge of computer control development at Monsanto Co. and visiting professor of automatic control at Washington University.

His B.S., M.S. and PhD degrees in chemical engineering were received at Pennsylvania State University and he also has an M.S. in electrical engineering from Ohio State University.

Societies/ User Groups

Lord Steps Down at SCDP

WASHINGTON, D.C. – Kenniston W. Lord Jr. has stepped down as president of the Society of Certified Data Processors (SCDP) and taking his place is G. Gary Casper, former vice-president of SCDP.

Lord decided to hand over the office so he would be free to concentrate on the society's Candidate Assistance Program (CAP), according to Wayne J. Smith, executive director.

Casper, who assumed office April 1, announced three goals he hoped to achieve during his tenure: an increase in membership, industry recognition of the Certificate in Data Processing (CDP) as a standard of acknowledged data processing proficiency and competency and the development of programs and materials that will enhance the value of the CDP.

Casper is a visiting professor of computer science at Brigham Young University.

Calendar

Aug. 16-18, Hershey, Pa. – **The Eight Annual Meeting of the National Association for State Information Systems (Nasis).** Contact: Carl Vorlander, Executive Director, Nasis, P.O. Box 11910, Lexington, Ky. 40511.

Aug. 18-20, Cupertino, Calif. – **Four Phase Users Association Annual Meeting.** Contact: Phil Shapiro, Allied Chemical Corp., P.O. Box 1039-R, Morristown, N.J. 07960.

Aug. 19-21, San Jose, Calif. – **Association of Field Service Managers Conference on Maintenance(AFSM).** Contact: AFSM National Meeting, P.O. Box 4853, Santa Clara, Calif. 95054.

Aug. 24-27, Waldenwoods, Mich. – **1976 International Conference on Parallel Processing,** sponsored by the IEEE Computer Society and the Association for Computing Machinery (ACM). Contact: Dr. Charles Elliott, Coordinator of Engineering Extension Programs, College of Engineering, Wayne State University, Detroit, Mich. 48202.

Aug. 27-Sept. 2, Atlanta – **Urban & Regional Information Systems Association (Urisa) Annual Meeting.** Contact: Ron Murch, Management Systems Development Department, City of Calgary, P.O. Box 2100, Calgary, Alta T2P 2M5, Canada.

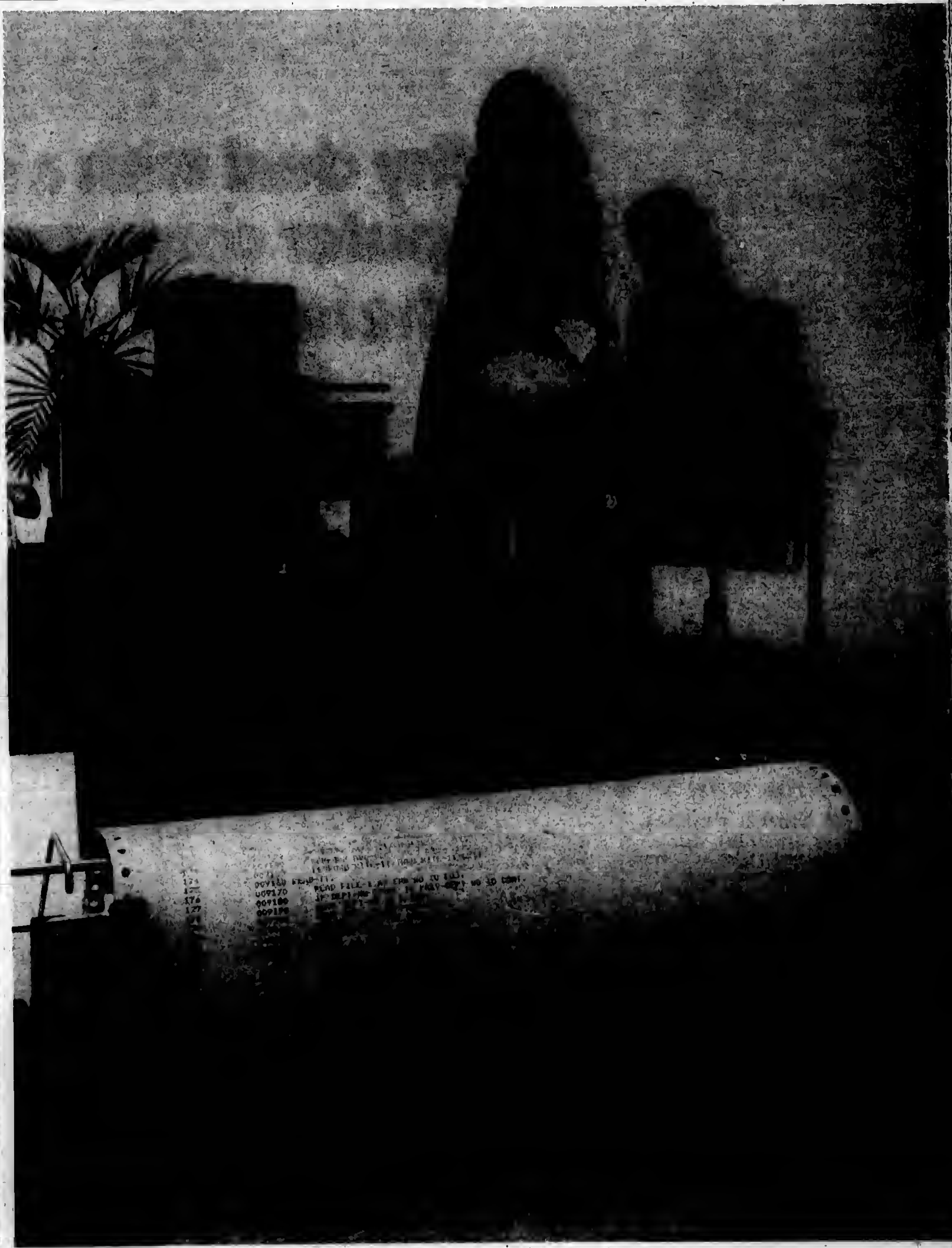
Sept. 1-3, Chicago – **Annual National Electronics Conference and National Communications Forum,** to be held concurrently by the National Engineering Consortium, Inc. (NEC). Contact: NEC, Oak Brook Executive Plaza #1, Suite 103, 1301 W. 22nd St., Oak Brook, Ill. 60521.

Sept. 7-10, Washington, D.C. – **Compcon '76 Fall,** sponsored by the IEEE Computer Society. Contact: Compcon '76 Fall, P.O. Box 639, Silver Springs, Md. 20901.

Sept. 13-14, Chicago – **Metric Management Workshop,** sponsored by the American National Metric Council (ANMC). Contact: George Buchanan, ANMC, 1625 Massachusetts Ave., N.W., Washington, D.C. 20036.

Sept. 13-15, St. Louis – **Fifth Annual Retail Operations Seminar,** sponsored by the National Retail Merchants Association (NRMA). Contact: Operations Division, NRMA, 100 W. 31st St., New York, N.Y. 10001.

Sept. 14-17, Los Angeles – **Western Electronic Show and Convention (Wescon).** Contact: William C. Weber Jr., Wescon General Manager, 999 N. Sepulveda Blvd., El Segundo, Calif. 90245.



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After Three Collapsed Last Year

Early Warning System Spots Trouble in N.J. Banks

By Catherine Arnst
Of the CW Staff

TRENTON, N.J. – A computerized information system implemented here acts as an early warning device to spot troubled banks.

The system, which officials believe to be the only one of its type in this country, was set up in response to economic conditions that plagued New Jersey and in response to the precarious situation of some banks located here.

Within the past year, federal authorities have undertaken a probe into the collapse of three state-chartered banks and the workings of about 17 other banks.

Officials in the Department of Banking (DOB) hope the system will uncover problem areas in banks quickly so remedial action can be taken before a bank fails.

The proposal for the system was made in early 1975 by the DOB and programming began that spring within the Department of Transportation's DP center, which operates the system.

At the end of 1975, the system kept information on the 96 commercial banks and 20 savings banks in the state.

Twice yearly call reports, which are a statement of assets and liabilities, are submitted to the DOB and input into an IBM 370/145 along with earnings and dividends reports.

The computer then generates reports which contain information compiled from these sources of data. Parameters and ratios have been established within which a bank's performance must fall and each bank is compared to others within its peer group to measure its relative stability.

Prior to implementing the automated system, New Jersey compiled the reports needed by the DOB manually. This took approximately 62 man-hours to accomplish from the time call reports were filed. The DOB did not utilize earnings and dividends reports at all under the manual system.

"We didn't use the data then to find out if banks were in trouble. That wasn't noticed unless it hit us over the head while looking at the reports," according to Roger Wagner, deputy commissioner of the DOB.

Now reports are directed specifically to that area. When a bank is found to have a weak spot, that information is turned over to a bank examiner who visits the institution, Wagner said.

Major Hang-Up

"The major hang-up so far has been getting the call reports in quick enough," Frank Carr principal bank examiner, said.

However, reports were generated with the automated system two weeks after the last report was filed when it was first used in January, which Carr considers "a pretty significant breakthrough."

"With the automated system we have not only increased our input and the amount of output, but have decreased our leadtime," he said.

The DOB designed the system, which was programmed in Fortran by the Department of Transportation. Various outside packages were examined, including a Federal Deposit Insurance Corp. (FDIC) model, but "we decided to go our own route," Wagner said. "And we got off the ground very quickly."

Programming was started in April 1975 and the first test run was done in August. In January, the system was officially put into operation compiling the call reports filed at the end of the year.

Test, production and operation costs total about $1,200 per filing, which is done twice a year, Carr said.

More Data Wanted

A $12,000 modification in the program has been proposed because the FDIC has changed the format of the call report and the program must be changed to accommodate it. With the new program, the DOB has asked that more statistics on individual banks be compiled.

"We are going to try for more sophisticated information all the time," Wagner said. "The key to a successful system is recognizing what data is needed."

The reports generated by the system are not made public although all the call, earnings and dividend reports are available to anyone, Wagner said.

New Jersey wanted an early warning system because it had more than the usual amount of economic problems, Wagner claimed. During the recession, loan classifications had increased more than 100% for two years in a row, he said.

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Editorials

Shades of the Future

The great IBM antitrust trial being held in New York City has taken a major step toward being held in an empty arena. The latest to abandon the scene is no other than Judge David N. Edelstein [CW, Aug. 2].

So attorneys for both sides appear each day and seem lost in the massive courtroom in Foley Square. Perhaps that is fitting, for many believe this trial is being forgotten in a society that prefers to deal with problems of the present rather than motivations of the past.

We can foresee some technical/electronic refinements in this case as it progresses, however. After the judge has adequately demonstrated that things can proceed smoothly without his presence, why not eliminate the litigants?

About six months from now, we can see the stage lights softly lit at the Foley Square courtroom. A cleaning person is silently sweeping the floor. In the front of the courtroom near the witness box, an IBM 3 equipped with a new audio interrogation/response feature is "questioning" a minicomputer/tape recorder system representing a government witness.

On the government side rests another mainframe that looks very much like a 370, but has been camouflaged with paint.

At regular intervals, the court clerk comes in to put a new spool of tape on the multidrive subsystem that has replaced the judge's chair.

Another clerk is conferring with an IBM 3 diagnostic expert. It seems the witness system has raised objections. The IBM CPU is creating electronic interference which is interrupting the logic commands being entered into the witness system by a government attorney at a remote terminal.

One feature has been added over the judge's bench. A huge counter now updates the ever-increasing cost of the trial in real time.

Other than that, little has changed and the trial drones on.

OS Users May Need Help

IBM's plan to drop support of OS/MFT and MVT to Class C [CW, July 5] had been expected by most of us for some time and shouldn't have been a shock to any user. There was no reasonable way in which IBM could continue support for the 360-oriented operating system indefinitely.

Ever since DOS/360 was effectively abandoned three years ago, users have been urging IBM to give them at least a year's warning before it cast them adrift. Now that the cutoff date has been set – and it's substantially more than a year from now for Release 21.8 – it's up to the users to prepare for the future.

Certainly, the Guide and Share user groups will continue to be supportive of their members.

Beyond that, there haven't been as many software packages to enhance OS as there were – and still are – to improve DOS. But the vendors and packages that are available may provide some help.

When DOS went to Class C, the Computer Lessors Association (CLA) set up a DOS Support Service for clients of the companies that make up that group. On the face of it, such dedicated support would seem to be unneeded by OS shops, which are typically larger and more sophisticated than their DOS cousins. And yet, there obviously will continue to be installations growing out of DOS and seeking something other than VS as their next step.

Perhaps now is the time for CLA or the software vendors involved with OS packages to take a look at how they can best help the user.

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DATA INPUT STATION
INDIVIDUAL SCORING CHALLENGES
TEAM SCORING CHALLENGES
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COUNTRY EXPULSION DEMANDS
Computerworld

Letters to the Editor

Dataproducts Expects Increase, Not Decline in Core Memory Sales

The article on Dataproducts in the July 12 issue of *Computerworld* stated that Dataproducts was phasing out of the core memory business.

I was interviewed for the information in the article, and our direction in the core memory business was misunderstood. Dataproducts is not phasing out of this business; in fact, this year will be a growth year for core memories in both revenues and profits.

The headline "Dataproducts Concentrating on Printers" was correct. Over 70% of our revenues are derived from line printers.

Last fiscal year, we did have a decline of core memory revenues to $13.5 million which was primarily due to recessionary pressures. A decline in revenues for one year does not mean a phase-out. We expect this year to be as good as any we have had in the past.

The predictions by many industry forecasters over the past few years that core memories were no longer going to be used are not true. The expected revenue increase by Dataproducts this year is because of our market concentration in areas where core memories have distinct advantages over semiconductor memories.

Dataproducts has always enjoyed a profitable position in the core memory business. We expect to remain profitable, and have made resource commitments to keep our dominant position in the marketplace.

Irving L. Wieselman
Vice-President, Product Programs
Dataproducts Corp.
Woodland Hills, Calif.

Data Past

Five Years Ago
Aug. 11, 1971

CHICAGO – One thousand attendees turned out for the 25th birthday of the computer at ACM '71 here. Association members wanted the Association for Computing Machinery (ACM) to spend less time on technology and more time on improving both the quality of information handling within the industry and the image of the industry and the computer outside the DP community.

– – –

MINNEAPOLIS – Control Data Corp. introduced its 921 optical character reader which used a helium-neon laser to drive the system. The device read at a speed of 1,200 document/min and cost $24,000 or $1,865/mo on a one-year lease.

Eight Years Ago
Aug. 7, 1968

WASHINGTON, D.C. – The telephone foreign attachments tariff remained in effect for another month because of a Federal Communications Commission (FCC) ruling that granted AT&T consideration of its appeal of the FCC decision to void the tariff. The tariff prohibited connection or attachment of equipment or devices to the public telephone system not authorized by the telephone companies.

– – –

WASHINGTON, D.C. – Three telephone companies entered the time-sharing services business while the FCC studied suggestions that the common carriers as a whole be prohibited from offering DP services. United Computing Systems, General Telephone & Electronics and ITT Data Services received a strong reaction from service bureaus because of alleged "advantageous position," the service bureaus said.

Grosch's Humor Lacks Punch

Like other intellectuals turned humorist, Herb Grosch suffers from the literary weakness that some of his attempts at humor confuse too many of us: we don't get the joke. An example was his July 19 column in which he seemed to be suborning the American Federation of Information Processing Societies (Afips) and its member societies, especially the Association for Computing Machinery (ACM), to fakery. It wasn't until third reading that I realized he must be pulling my leg.

He suggested that "without attempting to get broad membership concurrence, the associations . . . forward positions to Afips . . . which picks testifiers for hearings and puts out a Heavy Press Release describing the submission as 'consensus of . . . societies' . . . The idea is to slide the papers upstairs quickly and quietly."

Grosch had to be kidding. Surely he knows that on most controversial subjects, certainly the issue of data communications policy, there can be no clear ACM consensus: most of us individual members who would be affected are ignorant of the substantive facts and diverse enough in our goals so that any meaningful "position" has to be that of a minority. The societies' and Afips' tax positions are well-protected by those realities.

Afips and its member societies might well get in trouble by attempting to influence legislation, particularly if some spokesman puts his foot in everyone's mouth by pretending consensus where none exists. Grosch's column itself ensured such nonsense would/should be instantly recognized and ignored or challenged.

This column was one more sympton of Grosch's itch to change the technical societies into what he calls "trade guilds," or what most of us call trade associations. He should not read his election as ACM president to be a mandate for that kind of change.

Herbert S. Bright
Bethesda, Md.

Copyright

We're in the middle of another cycle of the recurring discussion of patents and copyrights and trade secrets and registry of ideas. Every person in the computer business is affected, from the student who pays an exorbitant price for his textbook to the retiree who Xeroxes articles from *Computerworld.* There is an off-again, on-again, away-again series of decisions on software patentability. There is a vigorous recalcitrant movement among computer hobbyists, proud of its program piracies. And in the background, ominously threatening the stability of the hot-lead-and-printers-ink trades themselves, and their age-old products, is the generation of large amounts of information on evanescent media like TV screens, terminal CRTs, digital wristwatch faces, and the like.

I myself believe that the handiness, the relative permanence, the transferability, the authority of hard copy will preserve its use indefinitely. There will always be the sexy brochure, the detailed operating manual, the carefully typed legal contract, the airport rack of paperbacks. But there will be — has already been — a fantastic growth in new ways of transferring data.

Look at what we have: phonograph records, audio tapes, cartridges, cassettes, and computer-generated audio response; punched cards of many sizes and shapes, and paper, plastic and foil tapes of many formats; automatic typewriters, I/O and free-standing line printers, teletypes, consoles and terminals; black-and-white and color CRT displays; cylinder and flatbed plotters; COM devices of a dozen provenances; even computer Braille!

And copying devices, from ten-dollar hectographs and supermarket coin-in-the-slot copiers to room-sized monsters with choppers and bursters and decollators and collators: not only to copy locally, but to copy from originals a satellite-link away.

Let me run through one or two major dilemmas, beyond the obvious rip-offs we all recognize. Take the college professor: torn, he is! On the one hand, he writes textbooks and scholarly material, and receives sometimes rather substantial royalties. On the other, he and his students benefit enormously from easy access to other people's material, and especially from inexpensive copying; from ghetto dweller to ARPANET member, access makes life richer.

And another case, pointed out first by Calvin Mooers: IBM puts out a copyrighted manual describing either the hardware-level instruction code of a new machine, or the higher-level language and operating system. This manual clearly states it is to be used to help customers, paying customers, write programs to run on the machine concerned. Now an RCA or an Amdahl uses that manual to design a competitive machine which accepts customer programs — IBM-compatible, we usually say — and competes successfully for hundreds of millions of dollars worth of IBM business. Is that "fair use"?

All of this, and much more besides, is being hashed over again in Washington. I'm deeply interested. But I don't see any simplistic solutions; the problems of protecting proprietary software is so remote from the problem of whether CRT display of data violates copyright, and so on, and so on, that I believe an enormous, compendious, easily amended omnibus bill may be necessary.

When I was in the Department of Commerce I recommended the following subpolicy to Senate committee counsel: copyrighted material could be entered without hindrance into temporary or permanent computer storage; it could be processed, substantially augmented or edited or reduced, and then output in any form without hindrance; it could be output for study and use (as, for instance, to choose alternate computer operating strategies without hindrance on transitory media such as cathode ray screens or regularly-destroyed console printouts, even in substantially unaltered form; on the other hand, to output sizable quantities of full text in permanent form, humanly readable — hard copy, we say — regardless of where the output appeared, would be a violation.

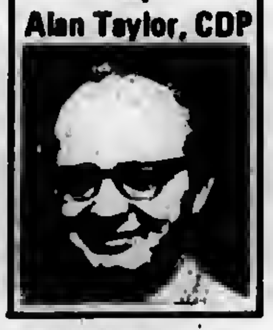
Wasn't much of a contribution, and in fact the recommendation was undoubtedly minced up in the great legislative grinder that operates on the Hill. My point is, dozens and dozens of such policy facets, reworded and circumscribed by pages of legalese, have to be adopted before a rational approach to copyright (let alone patent) rights in our age of modern technologies can be promulgated. Moreover, some mechanism to easily amend the law as new information capabilities flourish is vitally needed.

Finally, something like the social/economic device used to compensate composers and musical artists for commercial performance of their works will almost certainly have to be proposed and refined for our trade, and especially software. If every package could be tracked, and every use recorded, like every playing of Elvis' "Blue Suede Shoes," we'd have a new ball game indeed.

Herb Grosch

Graphical Method Checks Deeds-Type Check Digits

The Taylor Report
By
Alan Taylor, CDP



Check digits, except for the simple versions, are not easy to check. In production there are normally computers all set up to handle it, but during development of new systems there is an advantage in being able to know whether a check digit is correct quickly and accurately.

H. Block and A. Skough of the Swedish National Bureau of Statistics recently published some original work on this subject. Personally I am very grateful to them, because they not only caught an error in the Oct. 22 Taylor Report on the Deeds method, but also calculated a new table which permits the checking to be handled and demonstrated as easily as the original coding can be performed.

This table, which has the columns as inverse permutations of the rows of the reduction table of the Deeds method, appears on Page 4 of the report.

However, Block and Skough then went much further. They developed and illustrated a graphical method for checking the accuracy of the check digits of any of the Deeds type of check digits, which is something I had not realized could be performed.

The method uses nine tables for any particular basic permutation.

For example, one of the permutations they have studied (in place of the original Deeds number of 0496183275) is 0915243678. The tables this permutation gives rise to are shown in Figure 1.

These are used by starting with the original number, least significant end, in a single permutation called the START. Looking at the table to the right, find the tens digit of the number to be checked in the same row as the original units number. Now, turn Downwards and find the hundreds digit in the next table in the same column as the tens digit.

Repeat this process of matching the digit in each decimal place with a digit in each table moving from table to table at 90-degree angles.

For a number with more than 10 digits, reenter the tables to the right of the start block at the column with the same digit as the number under the last table in the same column as the decimal place digit.

The check digit will be found under the table in the same column as the last decimal place digit.

This really is a very simple method — easier to do than to describe. It can handle any length of number, can be used by anybody and requires no computer — not even a pencil and paper.

There is a lot more the Stockholm people are doing, upon which I will shortly be commenting. But this checking method is really worth looking at in detail. Try it for yourself.

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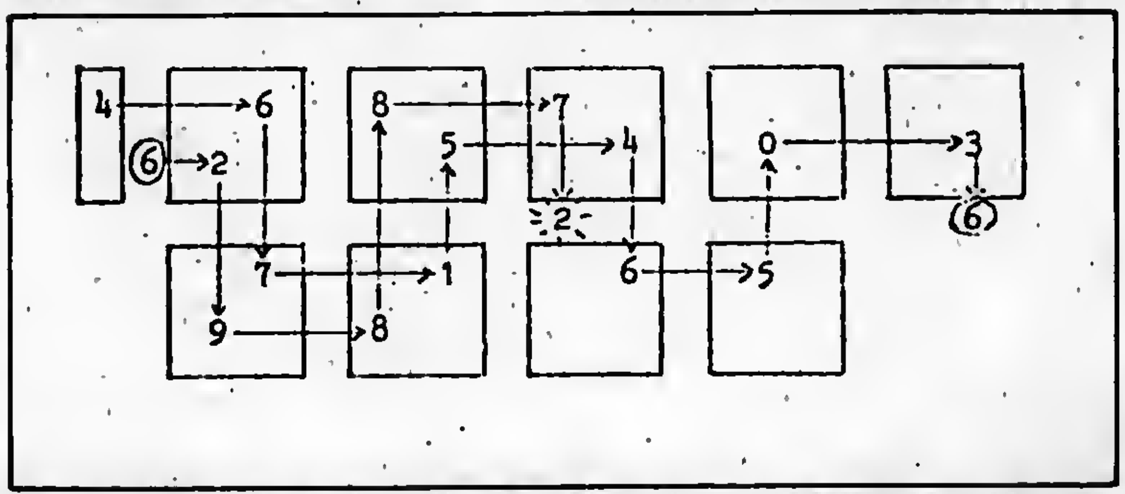

Figure 2. The tables are used by going through the number as illustrated above for the number 788923056451764, from the least significant decimal place. Basically, one turns 90 degrees for every digit in the number, and under the last row or column number the check digit is found.

	0	0	0	4	5	7	3	6	8	9	1	2
	2	1	3	0	4	5	7	8	9	1	2	6
	4	2	7	3	0	4	5	9	1	2	6	8
S	6	3	5	7	3	0	4	1	2	6	8	9
T	5	4	4	5	7	3	0	2	6	8	9	1
A	3	5	6	8	9	1	2	0	4	5	7	3
R	7	6	8	9	1	2	6	3	0	4	5	7
T	8	7	9	1	2	6	8	7	3	0	4	5
	9	8	1	2	6	8	9	5	7	3	0	4
	1	9	2	6	8	9	1	4	5	7	3	0
			0	1	2	3	4	5	6	7	8	9

0	8	1	7	6	9	2	4	5	3	0
6	0	8	1	7	2	4	5	3	9	1
7	6	0	8	1	4	5	3	9	2	2
1	7	6	0	8	5	3	9	2	4	3
8	1	7	6	0	3	9	2	4	5	4
9	2	4	5	3	0	8	1	7	6	5
2	4	5	3	9	6	0	8	1	7	6
4	5	3	9	2	7	6	0	8	1	7
5	3	9	2	4	1	7	6	0	8	8
3	9	2	4	5	8	1	7	6	0	9
0	1	2	3	4	5	6	7	8	9	

0	7	8	2	9	1	4	5	3	6
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2	9	0	7	8	5	3	6	1	4
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3	6	1	4	5	8	2	9	0	7
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0	4	3	2	1	5	6	7	8	9	0
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3	2	1	0	4	8	9	5	6	7	3
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6	7	8	9	5	1	0	4	3	2	6
7	8	9	5	6	2	1	0	4	3	7
8	9	5	6	7	3	2	1	0	4	8
9	5	6	7	8	4	3	2	1	0	9
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3	7	8	9	1	0	2	4	6	5
7	8	9	1	3	5	0	2	4	6
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9	1	3	7	8	4	6	5	0	2
1	3	7	8	9	2	4	6	5	0
0	1	2	3	4	5	6	7	8	9

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8	3	5	0	6	2	4	7	9	1	3
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4	7	9	1	2	6	8	3	5	0	9

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7	0	3	6	9	1	2	4	5	8
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6	9	7	0	3	4	5	8	1	2
3	6	9	7	0	5	8	1	2	4
8	1	2	4	5	0	3	6	9	7
1	2	4	5	8	7	0	3	6	9
2	4	5	8	1	9	7	0	3	6
4	5	8	1	2	6	9	7	0	3
5	8	1	2	4	3	6	9	7	0

0	1	4	9	8	2	5	3	6	7	0
8	0	1	4	9	5	3	6	7	2	1
9	8	0	1	4	3	6	7	2	5	2
4	9	8	0	1	6	7	2	5	3	3
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2	5	3	6	7	0	1	4	9	8	5
5	3	6	7	2	8	0	1	4	9	6
3	6	7	2	5	9	8	0	1	4	7
6	7	2	5	3	4	9	8	0	1	8
7	2	5	3	6	1	4	9	8	0	9

0	9	1	5	2	4	3	6	7	8
2	0	9	1	5	3	6	7	8	4
5	2	0	9	1	6	7	8	4	3
1	5	2	0	9	7	8	4	3	6
9	1	5	2	0	8	4	3	6	7
4	3	6	7	8	0	9	1	5	2
3	6	7	8	4	2	0	9	1	5
6	7	8	4	3	5	2	0	9	1
7	8	4	3	6	1	5	2	0	9
8	4	3	6	7	9	1	5	2	0

Figure 1. The START block and the nine matrices shown are all anyone needs to check the accuracy of Deeds-type check digits. These are set up for 0,9,1,5,2,4,3,6,7,8.

Letters to the Editor

Mark III Predates ADR Product 'First'

I have some comments on the article regarding Applied Data Research, Inc.'s (ADR) "firsts."

Informatics, Inc. began marketing its Mark I system in 1962. The system was described in a *Datamation* article of December of that year. This predates the ADR activity by three years.

International marketing of Informatics' Mark III system began in 1964, thus predating ADR's international activity by two years.

Sale of Informatics' Mark IV system alone, not to mention our Intercomm, Score, Life-Comm and other products, exceeded $30 million dollars by 1974, thereby predating ADR in that department by one year.

Informatics supports, maintains and improves its products on a regular basis, in the course of which we maintain a continuing relationship with all of our product users. Thus, ADR's program to do so is by no means unique.

John A. Postley
Senior Vice-President
Informatics
Woodland Hills, Calif.

'Dumb Westinghouse'

Regarding Herb Grosch's column, "Gerhard Neumann" [CW, July 5], "just dumb Westinghouse's" Nuclear Center has the world's largest commercial computer center; run by computer professionals.

Joel W. Williamson
Pittsburgh, Pa.

Authors Named

A column by Herb Grosch suggested programmers put their names on programs [CW, April 19]:

Grosch might be pleased to know that International Mathematical & Statistical Libraries, Inc., which distributes a library of over 300 routines to do mathematical and statistical computations, has done just this for over two years. Each routine bears the name of the person(s) responsible.

John Bolstad
Stanford, Calif.

GE Really Has Net

The headline on the July 19 letter to the editor "GE to Expand Also" gave me the impression *Computerworld* still didn't quite believe General Electric (GE) had a network.

GE has had a time-sharing network in Europe, Canada and the continental U.S. since 1969 and is the acknowledged pioneer in this regard.

MK 111 now services Japan, Australia, Singapore and all of western Europe from Scandinavia to Spain, Italy, Ireland and points between. All this, with the exception of Singapore, has been in place for several years.

Steve Salter
Pasadena, Calif.

DP Only a Tool

I agree with the conclusions in the editorial, "Learning the Hard Way" [CW, May 24], that drastic action must take place before bureaucrats will change anything and that too much information can be as dangerous as too little information.

But I don't extend this just to bureaucrats. This applies to *all!*

Let's remember that computers are only tools that assist people in accomplishing the required work.

Kenneth Erickson
Robbinsdale, Minn.

Former Clients Served

The article on point-of-sale (POS) system vendors in the July 12 edition of *Computerworld* was highly interesting to us as our firm has just begun a Retail Service Operation polling POS terminals.

However, I do take issue with the statement regarding the former customers of Androcor Division of Boeing Computer Services which CW reported were picked up by Service Bureau Corp. (SBC).

To my knowledge SBC was successful in obtaining only one of the former Androcor clients and we got the rest. These are all operational with us now whereas SBC is still converting the one client.

James A. Gross
President
Computer Associates, Inc.
South Bend, Ind.

Protecting the Guilty

Alan Schlustmeyer's letter [CW, May 24] berated John Kannarr's stand on "earned" data [CW, May 10]. When an individual defaults on a loan (Kannarr's example) or chronically writes checks for which there are insufficient funds on deposit that individual has indeed had benefit of trial – a trial in which he has, unassisted, convicted himself of financial irresponsibility!

Schlutsmeyer's "fundamental concept: due process" when it *really* works, does not protect everyone – nor was that its original intent. Its original intent was to protect the innocent. When it *really* works today, it protects only the guilty.

Rink Parker
Gulfport, Miss.

You're outgrowing your 3270.

Systems Designers Must Keep Walls From Tumbling

By Kenniston W. Lord Jr.
Special to Computerworld

A friend with whom I used to share the lecture circuit once astounded me by telling a class, "Building a system is just like building a brick wall. You put in a footing and place the bricks in place course by course."

When I was introduced, I proceeded to dispute his remarks.

To begin with, in order to build a brick wall, there are some laws, natural and civil, with which we must contend.

And then there are some standards for the brick.

And the mason has a right to be able to rely upon these specifications.

Then take the mason. A mason must have gained some minimum amount of education and have undergone some minimum form of training. He must have served an apprenticeship under the watchful eye of a journeyman.

And before he is able to practice his skill independently for gain, he must demonstrate to some regulatory authority that he does indeed have that skill and experience.

Next, what about the wall? There are building codes and safety codes, rules and regulations to which the mason and the brick with which he works must conform.

. . . And in This Corner

The brick must conform not only to the laws of nature but also to civil code, for if it does not there is someone with the authority and the power to direct that the wall be disassembled and to make it stick.

Why? Because the brick wall user – the public – has a right to be protected from a violation of natural laws and civil codes, to say nothing of shoddy workmanship. It's just a simple fact that society has decreed its citizens will be protected despite their unawareness of that protection.

The public which is subjected to data processing abuse is afforded no such protection. An individual does not know who has data about him and why, but he knows that data does exist. He has no assurance that you, the DPer, took his interest to heart as you designed your system. He does not have any assurance whatsoever that the system you build will protect his life, health or property.

He knows that when he walks by that brick wall somebody has taken steps to protect him as far as possible. But he does not know that any similar steps have been taken in his regard by those who would computerize him.

Without belaboring the point, he does not know he will be in any manner protected when we DPers get through with him. I think he has a right to have that assurance.

For all the problems we have witnessed with other professions, one thing is abundantly clear – the standards employed tend ultimately to purge the unethical, incompetent and dangerous practitioner, for in the end the unsuspecting public will be protected, whether they recognize it or not.

In short, DPers may – and not too far into the future – be facing a people vs. computer backlash. Forewarned is forearmed. But forewarned and ignored will only increase the amount and scope of the backlash. The time simply is now to take the steps to find a way to place some form of mandatory controls upon the systems we build.

Forms of Mandatory Control

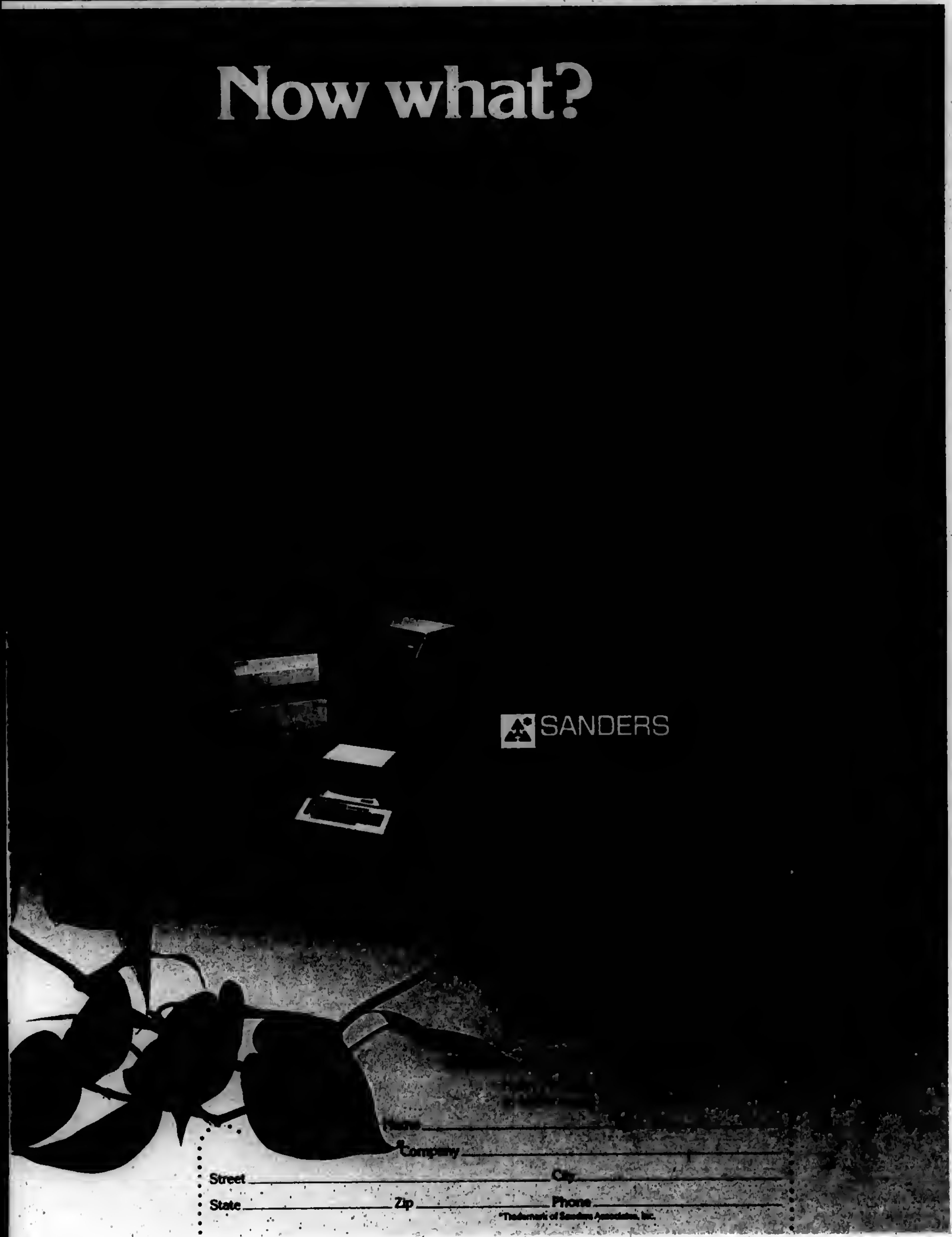
These mandatory controls may take one or more of several forms. It may happen in the form of civil approval of system design specifications, as in Berkeley, Calif. It may take the form of restrictive legislation, like that concerning privacy. It may take the form of educational standards – minimum learning criteria dictated by a legislative body. It may take the form of mandatory auditing requirements for the use of systems. It may take the form of systems certifications under specialized cases.

It may take the form of people certification. Or it may take the form of licenses to practice, penalties under violation of that practice. And then, it might well take the form of the refusal of the public to let you treat personal data on your computer.

However you slice it, something is going to happen. It may be this year, next year or the day after you retire. For sooner or later the public, the brick wall user, is going to become suddenly aware it is sick and tired of being treated as a number, carelessly, callously and with indifference.

And when that happens, the public will become suddenly aware you have within your hands the power to maim, injure, cripple and perhaps kill it.

With that awareness, folks, you will not only lose a profession – you'll lose a job.



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Concentrating Only on Cost, Schedule Can Make Breakthrough a Breakdown

By Miles Benson

Special to Computerworld

Breakthroughs are sometimes not all they're cracked up to be.

I remember the software breakthrough which was apparently so large that its announcement bypassed the computing literature and went straight to *Business Fortune* magazine. And I remember the inside-the-computing-field horse laughs which accompanied the knowledge that the breakthrough dissolved swiftly into a "Project Which Failed."

To the best of my knowledge, I'm afraid, *Business Fortune* never corrected its error publically. But that's breakthrough biz, I guess.

The Sociology of Computing

The background for this particular breakthrough began in the early '60s when a leading hardware house, Marketronics, announced the latest birth in its second-generation family of computers.

The Marketronics 2410 was born without software, which is not of course unusual in the computing field. What was unusual, though, was that Marketronics had a plan to do something about that.

Marketronics research, concerned about the cost and schedule problems associated with software implementation, had come up with a solution. The 2410 was the pilot system on which the solution would be proven. And the solution was a software building system called Phoenix.

Now Phoenix was more than a set of software tools, although it was primarily that. It was also a philosophy.

And the philosophy went something like this: The problem with software construction is that it requires a lot of high-talent folk for a long period of time. The solution to the problem lies in building the talent into a set of tools so smart that a few low-talent folk can do the same job in a short period of time.

Stop laughing. Remember, this is the early '60s.

Back at the Marketronics ranch, the research folk fanned the managerial fires, and the Phoenix Software Implementation System emerged from the structure of the philosophy. Phoenix took a half-dozen or so man-years to build, but the stakes were high and Marketronics never doubted the wisdom of its investment (not during the implementation phase, that is).

Now, enter the 2410 computer and the first test of Phoenix and its philosophy. To compete in its chosen marketplace, the 2410 needed a large bundle of software – an Input/Output Processing System (IOPS), a macro assembler (MA), a Report Generator Utility (RGU) and a Cobol compiler.

Those were the basics. Get those out of the way quick, the Phoenix philosophy said, and Marketronics could get into building some application software which might support sales to specific industry customers.

And there was the real market potential of the 2410 on the line. Phoenix needed to work.

Get set for a surprise: Phoenix *did* work! MA was on the air and satisfying Quality Control in a couple of months. IOPS followed along behind a couple of months later. RGU was done at the same time.

And even complicated Cobol, to full corporate standards, took only eight months. Marketronics managers fairly danced with glee.

And that's when the *Business Fortune* article was published. The breakthrough was really a breakthrough. From hardware birth to full software system support in under eight months. That was worth bragging about.

The Fall That Pride Goeth Before came slowly to Phoenix. There was the usual number of system trouble reports (STR), but they didn't scare anyone.

Software quality wasn't the prime goal of this particular breakthrough – only cost and schedule were. And quality wasn't surprisingly low.

What *was* wrong with Phoenix, and with the 2410 software, didn't emerge until the STR situation stabilized.

IOPS serviced interrupts about as rapidly as Aunt Jemima flows through a pinhole.

MA used as many passes to assemble as there were user macros defined, and that meant assemblies usually had to be scheduled by users on weekends.

RGU, slowed by IOPS, produced reports only slightly faster than the clerks in the shop had been doing it by hand.

And Cobol – alas, Cobol – compiled so slowly that computer operator shift changes occurred in the middle of 90% of a typical user's compilations.

You've got to give Marketronics credit for one thing . . . it knew when to admit it was wrong. Phoenix usage, after an appropriate investigation, was halted.

Users were notified that 2410 software was acknowledged to be seriously inefficient and that it would soon be withdrawn in favor of newer deliveries.

Not surprisingly, though, no one notified *Business Fortune* of this turn of events.

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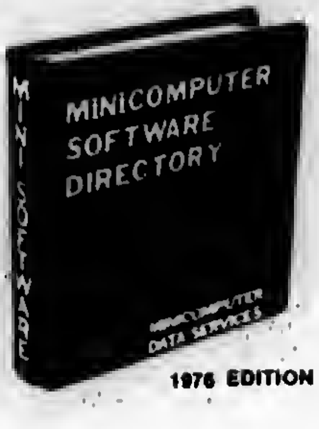

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Planning, Available 158 Eases DOS/VS-OS/VS Shift

By Don Leavitt
Of the CW Staff

LAKE SUCCESS, N.Y. – Some have called this town's name very appropriate for the personnel at the Chemical Bank's (Chembank) personal credit center here who recently completed conversion of a massive DOS/VS operation to OS/VS.

They not only changed operating systems and 1,000 program modules; they also moved the work from an IBM 370/145 to a 158 and added a new application in the process.

And the whole project was completed about a month ahead of time, according to assistant vice-president Lewis Berlent, who is in charge of the center.

Meanwhile, another group of Chembank people was shifting work from a second 145 and onto the bank's other major data center in New York City. Now both rented 145s have been returned to IBM.

The possibility of moving from the 145s was first recognized early last year when Chembank acquired Security National Bank on Long Island. Security had a 145 which it rented and a 158 which it owned.

Although hardware consolidation was a very obvious and desirable goal, there was originally some question on where the consolidated operations should be run, Berlent recalled.

The decision was made to stick with the two Chembank sites and to eliminate the separate Security operations. The owned 158 was to be moved to Lake Success.

All work not related to personal credit was moved from Security to Chembank's New York City center last year. Installation loan accounting operations, still handled in New York, were to be moved here and – "since it was better than ours" – the system used by Security was to replace the one used by Chembank, Berlent said.

Conversion of the workload at Berlent's center started last summer with a review of the on-line programs, including Master Charge credit-card processing. Two or three people were involved at first, "just getting to know the system" since it had to be rebuilt from self-contained operations to work under Chembank's "homegrown" teleprocessing monitor system.

There were 16 major on-line programs; all had to be revised to include reentrant code. Ten had to be rewritten because of file designs that would be inefficient under OS/VS, Berlent said, noting coding was begun heavily in mid-autumn.

Detailed work in planning the move of batch programs to the 158 began in January and was soon recognized as "more cumbersome" than the on-line work, though not necessarily as complicated.

JCL statements for every one of the 1,000 program modules had to be changed. That was "probably the biggest chore," Berlent said, but modification of programs with console display messages was another problem.

To eliminate as many messages as possible, the batch conversion team "decided to let the system decide what was important enough to tell the operator. When we encountered conditions that would have caused a message under DOS/VS, we went to an error routine," he said.

Unless the current condition exceeded a predefined threshold, the error was logged but no message was generated and no operator intervention was needed.

One of the toughest problems the group encountered was the changeover of the mortgage loan accounting package Chembank had acquired some time ago.

"We had to take it apart and 'unoverlay' it, for one thing. Changing all the I/O modules, which were in Assembler, was also tough," Berlent said.

Coding changes in the Cobol programs were generally not difficult, he acknowledged, since it was largely a matter of fixing Select statements and FD sections. Nothing ever happened to make his staff feel they had to call in outsiders to solve a problem, he added.

Having the 158 in place and uncommitted to production from March until June "certainly gave us a big boost," the vice-president said. The on-line conversion group worked days, the batch crew nights – with no interruption.

And the batch crew, in particular, learned to use TSO as a program development tool even though it took too much out of the system to use once production started.

The programmers used a double conversion approach since programs were subject to constant updating even while the conversion was going on. Once OS/VS versions were compiled, any changes in the DOS/VS programs still in production were also made in the OS/VS "copies."

But there was always the danger that some changes weren't picked up so, just before live work was to start under OS/VS, all the DOS/VS programs were again converted.

The whole project worked smoothly because "all our people wanted it to work" and because Berlent and his management crew pushed for a project checklist of tasks to be done before anything else started. And the programmers stayed with the operators around the clock for the first month of actual operations.

There couldn't be any unsolved problems. The 145s were shipped out the day after live work started.

'Dfast/VS' Frees Disk Space

FORT LEE, N.J. – Dfast/VS, a disk management package from Oxford Software Corp., allows DOS/VS users to work with any date-expired disk space as a partition-independent resource from which any type of file – except Vsam – may be allocated, the vendor said.

Based largely on Oxford's earlier Dfast, this package was developed "because, outside of the DOS/VS facilities available for allocating and managing Vsam files, IBM offers the user few tools for disk management," a spokesman claimed.

In addition to reusing "expired" disk allocations, Dfast/VS makes up for overallocation of extents on live files by truncating sequential and prime area Isam file space to the end-of-file marker at Close time, he said.

The package also provides the ability to dynamically allocate both permanent and temporary file space on disks shared by two or more CPUs, the spokesman continued.

A feature called Public Space Management (PSM) reportedly allows the user to dynamically allocate file space across pack boundaries. With PSM, extents for a data file can be defined on a "pseudo-pack" which may consist of two or more real packs or portions of them.

Related capabilities enable users to "absolutely protect" a file from being accessed or to selectively prevent a file's use by anyone except the current user, Oxford said.

PSM also provides the means of defining which packs or areas within those packs are available for dynamic allocations.

Device-independent file handling, beyond facilities available from IBM, are also part of the system, Oxford said.

The package also includes a reporting module which generates statistics about the use of files under Dfast/VS control.

Dfast/VS ranges in cost from $225/mo to $350/mo or from $5,625 to $8,750, depending on options selected.

Oxford is at 158 Linwood Plaza, Fort Lee, N.J. 07024.

Datapoint Adds Cobol for 5500; Compiler Based on '68 Standard

SAN ANTONIO, Texas – A Cobol compiler introduced by Datapoint Corp. for its 5500 disbursed processing systems is an implementation of American National Standards Institute (Ansi) 1968 Cobol specifications "with selected features of Ansi-74 also included," the vendor said.

With the new software, programs can be compiled on a 48K Datapoint 5548 Advanced Business Processor with disk storage and executed on "any" 5500 processor with user-required peripherals, the spokesman added.

Ansi Cobol '68 facilities supported by the compiler include Nucleus, Level 1; Table Handling, Level 2; Sequential Access, Level 1; Random Access, Level 1; Sort, Level 2; Segmentation, Level 1; and Library, Level 2, he said. Several features from Level 2 of the Nucleus and the Sequential and Random Access modules have also been included, he noted.

Features from the 1974 Ansi specifications include various mathematical options; WRITE statement differences; and CALL and EXIT capabilities comparable to those in the Inter-program Communications module.

Reflections of '74

Support for software-based programming switches and allowance for more relaxed punctuation and more flexible comment facilities – all of which reflect Cobol '74 – are also included, Datapoint said.

File compatibility between Cobol and all other Datapoint languages and between Cobol on the Datapoint gear and Cobol on a central mainframe is also a design goal of this compiler, the spokesman added.

Transparent Management

Indexed sequential files are supported; dynamic allocation and deallocation of disk space under that and other access methods is transparent to the user, he said.

Users may license Datapoint's Cobol for a one-time charge of $2,500 or for $65/mo. Maintenance support and documentation costs an extra $20/mo under either plan. The software will be ready for distribution in September, the company said from 9725 Datapoint Drive, San Antonio, Texas 78284.

NTIS Reprints Study Of Basic Compilers

SPRINGFIELD, Va. – "A Comparative Evaluation of Versions of Basic" by Bennet P. Lientz, published in the April 1976 issue of the *Communications of the ACM*, is now available from the National Technical Information Service (NTIS).

The article compares 10 current versions of Basic with each other, with two earlier versions and with the proposed standard for minimal Basic [CW, April 12].

Eight pages long and cataloged as AD-A024 247/9WC, the study costs $3.50 (paper) or $2.25 (microfiche) prepaid from NTIS at 5285 Port Royal Road, Springfield, Va. 22161.

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'Profile' Pinpoints Program Problems Without Using Data Collected by SMF

LOS ANGELES – CACI, Inc.'s Profile II, designed to locate and eliminate bottlenecks in programs running under OS or VS environments, does not use IBM's SMF data as the basis for evaluations, its vendor noted.

Profile consists of two major components, a monitor program and a report generator. The monitor oversees execution of the user program to be analyzed, issuing timer interrupt requests and, at each interrupt, making an entry on a trace file, a spokesman explained.

The report generator reads the trace file and produces summaries of the sampling data collected by the monitor. The most significant output, according to CACI, is a histogram showing the distribution of CPU time utilization within a program.

Identifies Control Section

In contrast to some other monitoring packages, however, Profile identifies control sections and not just core locations in its histogram.

This makes the graph easier to use not only with Cobol, for example, where the user does not normally function at the core location level, but with relocating systems which place programs "almost anywhere they want," CACI suggested.

The output shows what is using the most CPU time and is therefore the most likely candidate for rework to improve the operation of the whole program, the spokesman added.

Profile requires no modification of the operating system, "nor does it in any sense usurp control from the operating system," CACI noted.

"Perhaps more important from a user standpoint," the programs being monitored require no modification either, the vendor said.

Perpetual use of the Profile II system is available for $8,600. A time purchase is also available for $280/mo for 36 months, CACI said from 12011 San Vicente Blvd., Los Angeles, Calif. 90049.

Master Key Gives Access To 'Cryptex' Coded Files

NEW YORK – Cryptex-MK from Bi-Hex Co. is a software security product designed on the same principle as a mechanical lock master key system, according to a spokesman.

The package was derived from the original Cryptex program, "but it really is far more complex," he added.

The system logic is said to let DP users in "any IBM-type operating system" make up their own cryptographic keys for enciphering any data regarded as private.. The encoding can be applied at the record level, but not at the field level, the company said..

Data Passed

Keys and data are passed to the Cryptex-MK system by means of a called reentrant subroutine; the enciphered result is passed back to the user.

To retrieve the original data, the next user must supply the enciphered data and the same key used to encipher or the system master key.

The user's private key and the master key together form an 8-byte key which Bi-Hex described as similar in size to the data encryption standard promulgated by the National Bureau of Standards.

It is possible to change the system master key at will, the vendor said, without affecting any user's access to previously enciphered data. Master keys obsoleted by such a change cannot be used to access any data in the system, the spokesman added.

Cryptex-MK is seen by the vendor as "especially useful" in time-sharing environments in which individual users insist on privacy but the custodial responsibility of the network supervisor may require the possibility of unlimited access.

Cryptex-MK is available as a 2K object module supplied with tailored JCL and test program. The system costs $1,250 which includes two copies of the instruction manual and program support for 90 days.

Bi-Hex is at Suite 303E, 200 Park Ave., New York, N.Y. 10017.

ASI Course Aims at Vsam

ELK GROVE VILLAGE, Ill. – A multimedia course focusing on IBM's Virtual Storage Access Method (Vsam) and Access Method Services has been developed by Advanced Systems, Inc. (ASI).

The course includes seven videotapes, four audio tapes and guides for both the course coordinator and students, the company said.

"Vsam and Access Method Services" was designed for applications and systems programmers who create and maintain Vsam data sets and catalogs. It will also facilitate managers' and analysts' understanding of the capabilities of Vsam, according to ASI.

The training package lasts 22 to 24 hours and includes four hands-on exercises enabling students to execute Access Method Services jobs on their own computers, the vendor noted.

The course is said to include the latest features and changes of Access Method Services, incorporating the Independent Component Release used with Enhanced Vsam. A feature unique to the Enhanced Vsam, the alternate indexing concept, is also explained.

The course applies to any OS/VS environment; situations in which differences occur between VSI, VS2 Release 1 (SVS) and VS2 Release 2 and later MVS releases are clearly indicated, ASI said.

"Vsam and Access Method Services" is availble for purchase or as part of the vendor's subscription library, a spokesman noted from 1601 Tonne Road, Elk Grove Village, Ill. 60007.

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DP Dialogue

Notes and observations from IBM
which may prove of interest to
data processing professionals.

Distributed processing has stepped up the efficiency of warehouse operations at Wilson Sporting Goods Co.

Distributed Processing Links 25 Wilson Field Locations

Few companies today operate entirely out of one location. Even small firms are likely to have regional sales offices, while larger businesses may have dozens of operating units scattered across the country. For such organizations, a distributed processing system may help bring about some notable operating efficiencies.

Wilson Sporting Goods Co. of Chicago, a division of PepsiCo, is an outstanding example. Wilson is both a manufacturer and distributor of sporting goods, with one of the broadest lines in the industry. The company recently realigned its distribution network and now has 21 sales offices, each of which stocks some inventory, plus 4 large regional distribution centers. An IBM 3790 Communication System links all 25 locations to a System/370 Model 158 computer.

In a distributed processing system like the 3790, the workload is shared between the central computer and smaller units called controllers, which act as small processors. In the Wilson network each location has a controller online to a cluster of terminals and a printer, creating 25 small computing centers with local data processing capability.

Typically, after an order is entered at a Wilson sales office, it is transmitted via the 3790 to the Model 158 which forwards it to the appropriate regional center or centers. As the order is being processed, Wilson's companywide data base—including open orders, shipped orders and inventory—is updated. Customer inquiries concerning order status can be answered quickly through any terminal in the network.

"Customer service has benefitted greatly with the 3790," says Phillip D. Matthews, vice president, distribution. "The time required to process and ship orders has been cut almost in half. All our sales offices now get order and inventory reports overnight, instead of two or three weeks later. And nine out of ten items ordered are filled on demand, without backordering. Overall, office and warehouse productivity rose 30%.

"The system has made possible much closer coordination between manufacturing and sales," he adds. "Since we are constantly up to date on order volume, we can adjust production in advance to meet demand.

"All these factors, plus our new physical distribution facilities, have culminated in a reduction of approximately $10 million in our total inventories—which in turn has increased cash flow and reduced our need for working capital."

The 3790 runs under Systems Network Architecture (SNA), an advanced IBM teleprocessing structure that unifies communications networks for greater efficiency and easier growth.

Alyeska Develops a Total DP System in Record Time

When the Alyeska Pipeline Service Company was formed in 1970 to supervise the design and construction of the Alaska pipeline, many of the details of the project were still a big question mark. The only absolute certainty was the immensity of the challenge, particularly in the area of management control. The job called for the development of a total data processing system which would be flexible enough to handle very rapid growth.

Every aspect of the planning, construction and administration of the 800-mile pipeline must be fully documented to meet Federal environmental and regulatory requirements. That includes keeping track of inventory consisting of everything from Arctic outer gear to spare parts, managing a work force which swells to over 20,000 during the summer and providing accounting information for thousands of separate parts.

From the beginning, Alyeska has relied on various IBM computers to help handle the information. As the project progressed, the quantity of accounting data mushroomed quickly. "We went from processing less than 100 invoices a day out of our temporary offices in Seattle in 1974 to handling between 2-to-3,000 invoices daily on our Model 145 with VS/1 today," says Art Potter, manager of systems and computing. "Our online data base now includes over 2,500,000 records and it's still growing."

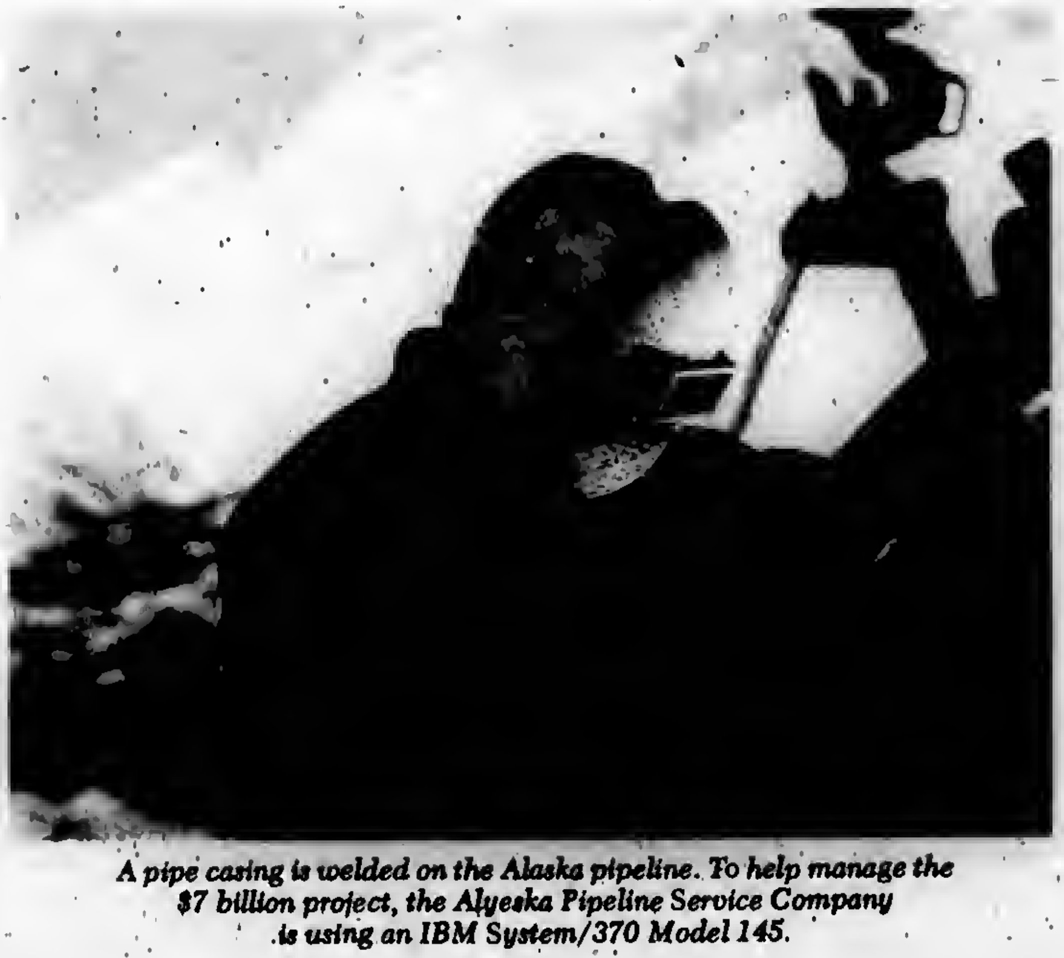
The toughest part of planning the system, according to Potter, was anticipating future data processing requirements without specific guidelines. "It was like compressing a 10-year corporate history into two years." says Potter, "We had to get every application up within a few months, because the actual pipeline construction was moving ahead so quickly."

Alyeska's system includes data processing equipment at five major construction sites and the Model 145 in Anchorage. Overall, the system must keep track of all the bills submitted to Alyeska by nearly 10,000 subcontractors. Each week, a performance report on pipeline progress is sent to the eight oil companies that own Alyeska for review on costs and efficiency.

Ultimately, records of all the expenses associated with the pipeline will go to the Interstate Commerce Commission (ICC) which is responsible for determining the rate of return the oil companies will be permitted to earn on their investment. Every expense will have to be documented and justified for the ICC.

When the pipeline is finally completed Alyeska will be responsible for the total operation of the pipeline and terminal facilities at Valdez, Alaska. Currently new data processing applications are being developed to support these pipeline activities. For example, sensing devices along the pipeline will transmit information to a computer in Valdez, which in turn will communicate with the System/370.

"One thing is certain," says Potter, "we could never have coordinated a project of this size without the computer. The financial accounting alone would have been a nightmare. We are confident that the experience our staff has gained working under the Alaskan constraints will provide us with the ability to develop the applications required when the oil starts to flow."



A pipe casing is welded on the Alaska pipeline. To help manage the $7 billion project, the Alyeska Pipeline Service Company is using an IBM System/370 Model 145.

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In Texas, a Giant Data Base Produces King-size Results

What insurance company has insured every military man who has walked on the moon? What's the largest property and casualty insurance company headquartered in Texas? Who is San Antonio's biggest private employer?

The answer to all three questions is the United Services Automobile Association. USAA is a unique member-owned cooperative, with over a million policyholders. Most members are active or retired commissioned officers in the armed forces and their dependents—and they're stationed all over the world.

The USAA home office is one of the world's largest and most efficient office buildings.

USAA has no agents. Its policyholders communicate with it mostly by mail and telephone.

To help meet their insurance needs—automobile, home, life, property—with efficiency and dispatch, USAA relies on a comprehensive IBM computing system built around an immense data base. It's one of the largest data bases running under IBM's IMS (Information Management System) used by any property and liability insurer anywhere, with 4.8 billion characters of online storage. The system runs on an IBM System/370 Model 168 computer.

The data base is remarkable for more than size. Unlike the insurance industry practice of indexing by policy numbers, USAA indexes by account (policyholder) numbers. Account numbers are cross referenced to policyholder's names. An average of three active policy numbers are carried under each account number.

This innovative policy of "a name, not a policy number" has some unusual advantages. A complete profile of any member's policies and other data can be flashed on any of 275 visual display terminals, both at the San Antonio home office and at five regional service offices around the country. Much of this data can be updated online, with the rest processed overnight.

And the transactions are copious. They include a daily average of 36,000 automobile data entry transactions, 24,000 policyholder online updates, 80,000 general inquiries, plus 5,000 hard copy batch document requests.

Data entry procedures, both for written forms and terminal display, are sequenced so that what appears on the terminal screen parallels the information on source documents. Compared with previous methods, this new online data entry system has reduced required keying time by 30% and operator training time by 60%. The transactions are edited as they are entered, thereby reducing the number of errors coming into batch processing by over 30%.

"Probably the best way to measure the cost effectiveness of our data processing operation is to compare the USAA underwriting expense ratio with the rest of the insurance industry," says Col. Martin Fishel, senior vice president, computer services. "Each year, USAA reports one of the lowest expense ratios in the industry. Our computer systems are a major factor in keeping these expenses down."

Bell Helicopter Gets a Lift from Computer-Aided Design

A helicopter rotor spins at 300 revolutions a minute as its turbine engine runs at 6,000 RPM. A multistage transmission, designed and manufactured by Bell Helicopter Textron, accomplishes a twentyfold reduction to provide lift for the craft. That capability alone makes it a very complex mechanism, but at Bell there is an additional requirement: the transmission must be able to run dry of oil for thirty minutes and survive.

That level of performance requires very precise design parameters. Bell's engineers have been using the Fort Worth company's IBM System/370 Model 168 to help produce reliable, cost-efficient helicopters. Much of the designing is done by engineers who interact directly with the computer via twenty-five IBM 3277 and 2741 terminals which are linked to the Model 168 under the Time Sharing Option (TSO) and OS/VS-SVS.

"With interactive computing, we've been able to increase the productivity of many engineers by a factor of four," says Joe Red, chief of scientific and technical computing. "By evaluating more options in the same time, they can minimize technical risks."

At Bell, computer-aided design is used to model everything from human factors, like legroom and headroom, to helicopter "survivability" under the most turbulent conditions. The company has developed over 500 specific application programs which run the gamut from designing the smallest gears to simulating the flight characteristics of the entire aircraft.

The computer is also used to formulate the "egg shell" configurations—the geometry of an aircraft's skin. In the manufacturing area, the computer keeps track of manpower requirements, operations plans and parts production schedules.

"Interactive computing and a comprehensive data base," says Red, "have helped us design and produce rotorcraft with the classical aerospace virtues—maximum strength, minimum weight and as much payload as possible."

The final touches are being applied to a helicopter at Bell Helicopter Textron in Fort Worth. The aircraft was designed with the help of computer simulations.

Multiprocessing Ups Availability at UOP

"With our corporate computing load increasing by 37% a year for the last several years, system availability had become critical." So says Steve Bloch, director of corporate computer services for UOP, Inc., explaining the company's recent move to an IBM multiprocessing (MP) system.

UOP, (formerly called Universal Oil Products Company) headquartered in Des Plaines, Illinois, is an engineering-oriented company which designs and builds petrochemical process and pollution control systems, and manufactures their engineered components. A major subsidiary constructs refineries. Its System/370 Model 158MP serves users in 18 divisions in the U.S. and Europe, plus several non-UOP companies.

In the multiprocessing system, two "tightly coupled" central processors back each other up to insure system availability. A single control program under the Multiple Virtual Storages (MVS) operating system automatically allocates work between the processors, dynamically assigning the load for maximum work throughput and best utilization of all resources.

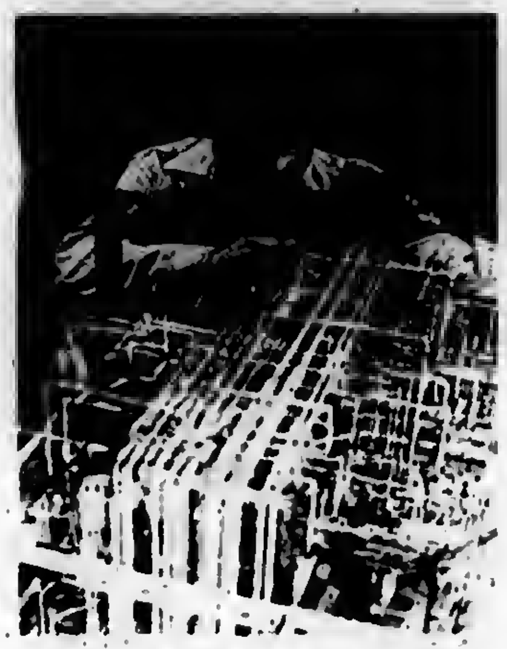
"Certain of our applications—such as shop order control—are synchronized with physical operations," Bloch explains, "so computer availability is vital. That's why we wanted the back-up facilities and automatic error recovery of the multiprocessing system."

In a three-shift, six-day-a-week operation, Bloch notes, the system has been available more than 99.5% of the time.

Engineering productivity is also crucially dependent on computer availability, he adds. Most of this work is unscheduled: engineers simply enter linear programs or other large-scale calculating jobs at will, via remote terminals in 22 locations.

This variability of demand was an important factor in the choice of a multiprocessing system. The UOP system solves difficult scheduling problems in sufficient time to avoid conflicts, eliminating most manual scheduling.

Engineers at Des Plaines use IBM's Time Sharing Option (TSO), which permits them to interact directly with the computer, completing their solutions while seated at visual display terminals. TSO also enables engineers to validate input data before initiating computer runs—preventing costly reruns and shortening turnaround time.



Computer applications in plant design are growing fast at UOP. This engineering model is of a new process plant.

The data processing department itself uses TSO to enter and test programs under development. In this application, Bloch asserts, TSO has increased programmer productivity by 62%.

Bloch says, "The multiprocessing system has been remarkably flexible, absorbing wide fluctuations in volume. It's given us excellent availability while responding well to our increasing demand for interactive computing."

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

76-4

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Original Forms Too Complex

'Son of Hipo' Proposed As Easier Charting Vehicle

By Joseph T. Rigo

Special to Computerworld

Concepts and Techniques

Let's face it. Hierarchy plus input, processing, output (Hipo) charts are great, but they are so complicated to create and maintain that no one uses them.

Hipo charts were developed by IBM. They can be enormously helpful as tools for structured system and program design and for documentation.

They graphically display the inputs to an operation, the processing functions and the outputs. The operation can be almost anything from a computer program to a master plan for housebreaking your dog.

Hipo charts work beautifully as documentation for complex operating system programs. They work equally well as part of the functional specifications for routine commercial applications.

They can be understood by almost anybody: programmers, bank presidents and even systems analysts.

Project managers like Hipo charts. They are willing to pay any size internal billing rate to get a trained technical writer to produce them.

Everyone Likes Them

And there's the catch. Everyone likes Hipo charts – provided someone else will do the work.

The problem is that Hipo was invented to meet the needs of a complicated systems programming environment. The most complex version of Hipo is the only one available.

Hipo is cram full of symbols. It has big white arrows to show the flow of data, big black arrows to mark entry points and exits and narrow arrows for pointers and notes. It has circles and squares, big boxes, little boxes and all the standard flowcharting symbols.

A person must have a nontrivial degree of skill to draw the charts in the first place. And it takes a great deal of skilled drudgery to keep them up to date. At least one new chart has to be drawn from scratch for every significant change in specifications.

Attempts to Automate

There have been some attempts to automate the process. Clint Jurgens and Dick Olson of Sperry Univac in St. Paul described one effort at the ACM '75 conference last fall.

They modified a software package that normally produces electronic circuit diagrams. Their Hipo charts look like wiring diagrams for your television set, but they do the job, and they are easy to update.

In most places, the work must be done by hand.

The amount of required, repetitive labor is one reason Hipo is not widely used. Another is that a routine commercial application simply doesn't need all the power available with the full assortment of circles, squares, boxes and arrows.

Consider a simplified approach. Call it Son of Hipo, or Hipo Jr.

For illustration, assume a standard master file update program. On the left side of the page, put a list of inputs: the master file, a transaction file and perhaps a table of codes used in processing.

On the right, put a list of outputs: the updated master file, a couple of reports and a parameter to be passed.

Put a great big box in the middle. It is for a list of processing functions performed (or to be performed) by the module.

A simple arrow connects each input item with the first processing function that uses it. Another arrow connects a processing function with the output it creates.

Plenty of Room

There is still plenty of room on the page for miscellaneous text. The text includes identification of called and calling modules, job and procedure names and references to file and record layout forms as necessary.

Joseph Rigo, president of Sysdoc, Inc., a New York-based documentation consulting group, described the accompanying article as "sort of an answer to Ed Yourdon's piece [CW, May 31]."

The result is a programmer's version of the flowchart that is customarily produced for the data center operations staff. The main difference is it emphasizes processing functions.

The chart is easy to update. It can be maintained on a standard text editor. For best results, include it as comments in the program listing. If it is in the listing, maintenance programmers are more likely to use it and keep it up to date.

This approach has an important byproduct. It introduces everyone to the fundamentals of Hipo charts.

The arrows, boxes, squares and circles are still available. They can be added as needed when a more complex design application comes along.

In the meantime, people may start using Hipo. It really does work.

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TALK WITH THE INDUSTRY LEADER.

DP Leaders Must Stop Fire Fighting, Start Managing

By Jack Stone

Special to Computerworld

A new opportunity has developed for computer center managers to impact their total organizations, not by further advances in DP systems and technology, but by leading the way toward new programs of human relations and personnel development – helping to build a new "quality of life" in American business and government organizations.

DP management today is in a rare position of gaining top management support in addressing the center's personnel situation and setting an example for the rest of the organization. And why shouldn't it be the DP manager's role?

While each article I have written thus far has discussed a selected topic related to DP human relations, they can all be summarized in a short list of major action goals center managers must embrace if they are to accept the challenge of becoming leaders of people as well as leaders of technology.

Peopleware

Goal 1 is an end to the disruption. There simply is no operating department in American organizations today whose day-to-day activities are so filled with turmoil and crisis as the production-oriented computer center. Although serenity seems always just around the corner, the fact remains the pace has been hectic for over a decade!

There are those who say that "fire-fighting" is the natural order of DP operations and that the effectiveness of DP systems would wither away in a sedentary climate.

However, I do not accept this thesis, simply because over the long run the disruptive environment does not permit DP personnel to complete assigned tasks to their own levels of achievement and excellence.

Turbulence in operations erodes motivation and denies full satisfaction of accomplishment; it encourages poor performance and inefficiencies. To end disruption, DP management will be required to take strong and unpopular stands with top executives.

Management may be forced to request the deferral of new hardware/software until currently installed systems are adequately debugged; the delay of new, critical applications until those currently in operation are found acceptable to users; or a substantial increase in personnel to meet existing development and production commitments.

In net, it is necessary to stop overcommitments to production, premature release of systems in development and understaffing of key projects, three of the primary causes for disruption.

More Leadership

Goal 2 is new leadership capabilities for the DP management team. Most DP managers and supervisors view their responsibilities as technical and operational in nature and give little consideration to their managerial responsibilities as professional leaders.

Many DP managers come to mind who need development in the principles of effective leadership: a simple understanding of and sensitivity to the unique human characteristics of each employee; personally conducting skills training of employees; counseling of subordinates to improve job performance; finding ways to enhance employee motivation; applying creative talents to solve personnel problems; building mutual respect and confidence through communications; or taking steps to change employee attitudes.

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations and personnel management.

Selected letters will be published in Computerworld, *along with commentary by Stone, in a column beginning shortly.*

Letters should not exceed 500 words and should include the name, title, organization and address of the sender for acknowledgement purposes. This information will be treated as confidential and withheld from publication unless authorized for release by the sender.

Superior supervisory skills are mandatory for long-term success of the center. Counseling and training in supervisory leadership are essential programs for the future.

Development Programs

Goal 3 is an effective development program for each employee. Most DP people want to grow and produce to the maximum of their capabilities, probably more so, I believe, than any other segment of the American working population.

And why shouldn't we? Although the industry and the marketplace have enjoyed a phenomenal expansion since their beginnings, most of us believe the really serious expansion is yet to come.

Yet, the minds of the rank and file of DP personnel are filled with despair when relating to nontechnical matters of personal development, opportunity and job satisfaction. Literally everyone I have talked with has expressed serious dissatisfaction with the job, grave misgivings about management and important concerns about their organization. The levels of personal achievement have fallen well below the levels of personal aspirations, DP people feel they have worked hard to advance the capabilities of their organization through new DP systems, but that management has not responded in kind by developing plans for their career success.

Each employee seeks a roadmap for the future, based on individual career goals, with alternate pathways to higher level technical or supervisory positions. Each person needs clear statements and current information about job opportunities throughout the organization, including those outside of DP, plus experience, education and training requirements for such jobs.

Each individual wants to participate in all the training that is available, expecting the firm will either provide it in-house or pay for outside services.

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Equipment Compatible With SDLC

Adoption of ADCCP Expected to Spark New Terminals

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – When the Advanced Data Communications Control Procedure (ADCCP) is finalized by the American National Standards Institute (Ansi) as a U.S. data link control protocol, it will probably trigger the introduction of compatible terminal equipment.

The ADCCP standard has been under consideration by Ansi for several years. Originally it was an IBM concept, but IBM has now backed Synchronous Data Link Control (SDLC), so ADCCP is expected to become the link control protocol used by non-IBM terminal suppliers.

At least three major DP suppliers – Burroughs, Control Data Corp. and Univac – are known to be developing terminal equipment compatible with ADCCP in its present format. Digital Equipment Corp. has a bit-oriented protocol that is similar to ADCCP.

The relationship between IBM SDLC equipment and ADCCP equipment is not yet clear, but in general the ADCCP terminals will probably operate without major problems within an SDLC environment.

On the other hand, the SDLC equipment may not be totally compatible with ADCCP nets, according to Gerald Shutz, chairman of the Ansi X3S3 subcommittee that is working to bring in a final ADCCP standard.

Shutz described the relationship of ADCCP and SDLC as being similar to the relationship of a station wagon and a car – the station wagon can do everything the car can do, but the car can't do everything the station wagon can do, he explained.

Even though several vendors apparently are planning to introduce ADCCP terminals, the standard is not yet finalized. Standards efforts proceed slowly, and Shutz said a final ADCCP standard could still be as much as a year away.

Goes Further Than HDLC

The standards efforts on ADCCP go far beyond SDLC, however. In fact, ADCCP goes further than the Higher Level Data Link Control (HDLC) proposal of the International Standards Organization (ISO).

The significance of HDLC is that it is close to the X-25 standard proposal currently being Implemented in several international packet-switched networks, including the U.S. Telenet system and the Canadian Datapac.

The X-25 proposal now has the status of a CCITT recommendation, and HDLC answers parts of the X-25 proposal that have not yet been resolved, a standards expert said. CCITT will probably meet early in 1977 to come up with a more definitive version of X-25.

There is "almost compatibility between them all unless something goes wrong," Shutz said. A user operating with an ADCCP terminal will probably be able to interface with networks that utilize an X-25 protocol, but even this is not totally certain because there is no ACDDP terminal yet available.

The Burroughs Data Link Control (BDLC) is presently one of the data link control procedures closest to ADCCP in its current form. BDLC "follows ADCCP," according to the standards source.

A number of non-IBM terminal suppliers are waiting to introduce terminals when ADCCP reaches a final form. These ADCCP devices are expected to have a higher level capability than IBM SDLC terminals.

'Cast In Concrete'

At present the X3S3 committee is balloting on ADCCP. Once this step is completed, the standard will be considered by the Ansi X3 committee.

After X3, the Board of Standards Review gets to consider ADCCP; the standard will then be published.

But users may not have to wait quite that long. If X3 gives its approval, the standard "is pretty much cast in concrete" and vendors will probably begin to introduce their ADCCP terminals. All that vendors would have to do at that point to meet the ADCCP protocol would be to add some software or firmware to their equipment designs.

And most of the network carriers, including those with packet-switched networks, intend to interface with ADCCP equipment. For users, the data link protocols are slowly evolving into standards; once that happens, terminals will follow.

Portable Units Increase Salesmen's Selling Time

CHICAGO – Salesmen for a tobacco and confectionery distributor located in nearby Countryside are reportedly gaining extra hours of selling time by employing electronic ordering terminals to write and transmit their daily orders.

The terminals allow S. Bloom's salespeople to bypass the paperwork and driving time previously necessary to get their daily orders to the warehouse by a 6 p.m. deadline, according to Steve Bloom, the firm's vice-president.

S. Bloom's salespeople are using terminals to enter their orders instead of driving back to the warehouse each evening to deliver them.

The company is using Source 2100 data entry terminals from MSI Data Corp. "The most significant advantage of the MSI electronic ordering system is that our field salesmen now have the additional time to sell our merchandise," Bloom said.

Bloom wholesales and distributes tobacco products, smokers' aids and candy items to approximately 2,200 retailers in the metropolitan Chicago area. The competitive nature of this type of distribution industry demands overnight processing and next-day delivery of all orders, Bloom noted.

Bloom's salespeople carry the unit into the field with them and either key in the order data at the retail store or directly after the visit while sitting in their cars.

Most salemen telephone the recorded order information to Bloom's DP center twice a day via the Source 2100 terminals to an MSI Systems IV receiver with one receiving line. The data receiver can be equipped with four or more lines if necessary.

An entire salesman's order can be transmitted at 120 char./sec to the receiver over ordinary telephone lines in a call which normally takes less than two minutes. Bloom salesmen used to spend hours on the highways each evening driving to the warehouse to deliver their orders, Bloom said.

The System IV receiver automatically verifies all incoming orders. When recorded on the receiver's magnetic tape, the data is ready for direct input into the company's IBM 3/10 system.

Order information is fed into the computer for processing by 8 p.m. the same evening. Complete invoicing and picking documents are then printed, and the warehouse can begin picking the orders by 10 p.m. By 6 a.m., Bloom's delivery trucks can begin their routes.

Salesmen are now carrying an order list which describes the company's entire product line. This list replaced mark-sensitive coding forms which carried only 60% of Bloom's product line.

Bloom expects to see a dramatic increase in line volume as a result of the system. "I expect with time the increase can easily reach 5%, which will be a substantial volume increase," he said.

IBM Terminal Has Multileaving

WHITE PLAINS, N.Y. – IBM has introduced a version of the 3777 remote job entry (RJE) terminal that includes a binary synchronous multileaving capability and a 1K-character gas panel display.

Designated the 3777 Model 2, the terminal can operate at speeds up to 9,600 bit/sec, print at speeds up to 1,000 line/min and read cards up to 400 card/min, IBM said.

The binary synchronous multileaving gives users the ability to include in one transmission block the data that can be sent to more than one I/O device; this is accomplished by including various control blocks within a transmission block, IBM explained.

The multileaving feature is generated at the host mainframe, which produces a terminal object card deck. This deck is then loaded into the Model 2. The multileaving was previously used by IBM on the 360/20 Submodel 5 workstation.

The multileaving runs with ASP, JES2, JES3 and RSCS and with the VS1, VS2 and VM/370 operating systems, IBM said.

A typical 3777 Model 2 with 3202 Model 3 printer, 400 card/min reader, gas panel display and required attachments costs $1,682/mo under the 24-month Extended Term Plan (ETP). Standard under the Monthly Availability Charge (MAC) is $1,927/mo and the purchase price is $65,385.

The gas panel display is an optional item priced at $90/mo ETP, $106/mo MAC and $3,600 purchase; the multileaving is a no-charge item. First deliveries are scheduled for the first quarter of 1977.

Let's talk about a brand new Terminal

Here it is! The *new* AJ 832. This new printer terminal combines high speed with versatility, reliability, and operating convenience. There are plenty of features as well, for example:

- A 256-character buffer memory
- ASCII, EBCD, and Correspondence Codes in one
- 30 or 45 cps throughput
- 17 key numeric pad with programmable function keys
- High speed plotting and plotting software, too
- APL keyboard

There are many options available too, such as pin feed platen or forms tractor, side shelves, and fan-fold paper trays.

We have a nationwide sales and service organization to stand behind every new AJ 832, and you have the choice of purchase or lease (month-to-month if you wish).

We'd like to talk about everything this new AJ 832 has to offer. We'll start by sending you our brochure. Just fill in the coupon or give us a call direct.

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DEC Unveils Interface Series

MAYNARD, Mass. – Digital Equipment Corp. has introduced a series of communication interfaces for its PDP-11 systems.

There are three units in the series: a single-line high-speed synchronous interface called the DMC11, a single-line multiprotocol synchronous interface called the DUP11 and a low-cost asynchronous 8- and 16-line multiplexer called the DZ11, DEC said.

The DMC11 is designed for high-speed links between PDP-11s using the DEC Digital Data Communication Message Protocol (DDCMP). The DDCMP functions are implemented in hardware through use of a high-speed microprocessor

This arrangement permits high-speed operation (56 kbit/sec or 1M bit/sec) over coaxial cable between CPUs located in the same facility, according to DEC. For operation over common carrier facilities, the DMC11s can be interfaced to synchronous modems at data transmission rates up to 19.2 kbit/sec.

The DUP11 is described as the first of a series of communication interfaces with multiprotocol capabilities. It is capable of handling bit-stuffing protocols such as Synchronous Data Link Control (SDLC) and Higher Level Data Link Control (HDLC).

The DZ11 multiplexer interfaces 8 or 16 local or remote asynchronous terminals or modems to PDP-11 systems.

The DMC11 high-speed synchronous interface is priced from $2,145, with deliveries scheduled for September. The DZ11 multiplexer is priced at $2,100 for an 8-line version and $3,400 for a 16-line version; deliveries are scheduled to begin by the end of July. The DUP11 multiprotocol interface is priced at $1,375.

Data Entry Units Serve as Core Of Retailer Inventory Service

LOS ANGELES – A large computer service bureau based here provides specialty retail store chains a retail inventory management service which depend on data entry terminals for input of daily sales transactions.

"We've developed a highly sophisticated system that tells retail store management everything about the movement of store stock," according to Bob Yauney, Retail Division manager at Silton Data.

"A simple eight-digit code describes every piece of merchandise in inventory. This code number allows our computer to follow the movement of each individual garment from the time of wholesale purchase up to the time it is bought by the consumer."

Silton's retail chain clients receive computerized reports that analyze every aspect of their retail operations from merchandise movement to salesperson performance.

The company's Retail Inventory Management System (Rims) enables retailers to eliminate out-of-stocks, optimize store inventory for turns, reduce marked-down merchandise and alleviate the problems of slow movers occupying too much of store display space.

By numerically labeling specially printed pricing tags with the code number – which describes the garment by manufacturer, style, size and color – Silton's Burroughs Corp. B4700 CPU can chart the movement of each individual piece of merchandise on a daily basis.

Helps Spot 'Movers'

Turning merchandise is crucial to the retail garment business. Maintaining a fluid inventory maximizes margin of profit and brings a favorable return on investment. Slow movers, on the other hand, are dead money – and usually these items get unloaded at marked-down prices to clear floor space for new merchandise.

Computerized reports help management spot "movers" in time to get reorders in and have them delivered to turn more merchandise. The reports pinpoint good and bad turn covers.

Checking vendor performance is also a useful feature of the reports. If a certain product line accounts for 5% of a retailer's sales, but represents 30% of his inventory, the retailer can adjust his purchasing decision to fall more in line with his sales.

Silton Data decided to complement its inventory reporting system with MSI Data Corp. Source 1100 data terminals because most specialty retail chains aren't in an environment suited to more expensive point-of-sale (POS) cash register terminals, Yauney said.

Unlike large department stores with 50 or more cash registers in each store, the average specialty retail store is a one-register environment, he explained.

Additionally, the length of time usually required to make a sales transaction at a POS register is eliminated by using the data terminal system, Yauney said.

"With the terminal in the store, the manager can enter his sales data at any time simply by keeping a portion of the sales tag at the time of the sale. He is not restricted to inputting data at the time of the sale," he said.

At the time of sale, the salesperson removes a portion of the garment tag with the numeric identification code and a space for sales identification number, which is recorded for commission purposes and analysis of sales performance.

At the end of each sales day, the manager or assistant enters the information on the sales tag and transmits it to Silton's DP center.

Device Switches Modems To Either of Two Channels

PROVIDENCE, R.I. – International Data Sciences, Inc. (IDS) has introduced the Model 8506-D selector switch packaged in desktop configuration.

The 8506-D is used to switch the 25-pin EIA RS-232 or CCITT V.24 interface to either of two outputs.

Utilizing the 8506-D, one modem may be switched to either of two front-end-processor data channels or to either of two data terminals. The unit may be used to switch a data channel from an on-line modem to a backup modem or for switching from a leased line modem to dial backup.

The switch costs $105 and delivery is 30 days from IDS at 100 Nashua St., Providence, R.I. 02904.

DOCUMATION'S PRINTER/READER/PUNCH:
YOUR IBM 360/370 WILL THINK IT'S IBM.
THE PRICE PERFORMANCE RATIO WILL TELL YOU IT'S DOCUMATION.

Documation just introduced a new Printer/Reader/Punch Subsystem you should introduce to your IBM System 360.

DOC 2250 OR DOC 1800

When you replace your IBM 2540 Reader Punch and IBM 1403 Printer or 3211 with Documation's new Printer/Reader/Punch Subsystem, your main frame won't notice the difference.

But, there are some very significant differences you will notice.

You can take your choice of two printer models — our DOC 2250 (printing 2250 lpm with a 48 character set) or our DOC 1800 (printing 1800 lpm). With some extra advantages thrown in.

Operating in the 3211 mode, the DOC 2250 prints 10% faster than the 3211. The DOC 2250 costs less than half as much as the 3211. The DOC 2250's integrated microprocessor controller eliminates the need for a separate controller. And because the DOC 2250 has built-in, comprehensive microdiagnostics, maintenance can be done off-line without tying up the host system.

The DOC 2250 also offers: buffered vertical format control; fully-buffered print line; operator-changeable character arrays; Universal Character Set Buffer (UCSB); up to 6-part forms; paper slew up to 100 inches per second; power cover; power stacker.

The DOC 1800 offers all the features of the DOC 2250, but at a reduced printing speed. And a reduced price.

The 1403 compatibility feature allows both models to operate in the 1403 mode. Your CPU will think it's working with a 1403. You'll know you're getting a 2250 or 1800 lpm printer for just about the cost of an 1100 lpm printer.

The read/punch side of the Subsystem (the DOC PC 6000 Reader and the DOC PC 50 Punch) recognizes the same command set as the IBM 2540. All data and control signals transferred between the host and the PC 50 and PC 6000 pass through a subsystem microprocessor controller built into the PC 6000. Utilizing Documation's own patented riffle-air pick and stack system, the PC 6000 reads 1000 cards per minute and stacks them in one of two stackers. Options include 51 Column Card Read and Optical Mark Read.

The PC 50 Punch Model 3 nominally punches 50 cards per minute; Model 4 punches 100 cpm. The PC 50's microprocessor controller enables it to detect and correct punch errors automatically without operator or host system intervention. With the Pre-Read feature Model 3 reads 300 cards per minute, Model 4 reads 400 cards per minute. Other PC 50 options include a 51 Column Card read/punch feature, an interpret feature, a second input hopper to enable off-line reproduction of card decks; a Read Column Eliminate feature and Optical Mark Read. Off-line, the PC 50 will gang-punch, reproduce and interpret, eliminating the need for extra pieces of equipment.

The ruggedness and reliability of Documation equipment in the field is legendary. Documation equipment has proven itself so reliable in fact, that card-handling equipment users ranked Documation their #1 preference in 1975 media surveys. All Documation products are designed in-house. Then all parts and machines are fabricated in our own sophisticated precision manufacturing facility, giving Documation a unique control over product quality and reliability.

DOC PC 50 DOC PC 6000

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You have an IBM 360 or 370. We have the Printer/Reader/Punch that offers the most cost-efficient subsystem available. For more details, call or write Mr. Roy Ostrander, V.P., Box 1240, Melbourne, Florida 32901. Phone (305) 724-1111.

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Under FBI Contract

Calspan Makes Fingerprint Matching a Hardware Job

By Nancy French
Of the CW Staff

BUFFALO, N.Y. – Law enforcement came one step closer to reading, classifying and matching fingerprints automatically with a new piece of classification hardware demonstrated by Calspan Technology Products, Inc. here recently.

Under a contract from the Federal Bureau of Investigation (FBI), Calspan has speeded the classification process previously performed by software by making it a hardware function, according to John Jones, a spokesman for the FBI's Identification Division.

The new product, which classifies fingerprint cards at about 600 card/hour, is known as Fingerprint Classifier System (Fics).

Fingerprints are classified and matched according to two general characteristics: ridge directional flow and the location of and relationship between the print's minutiae, according to Jones.

But before a fingerprint can be classified by Fics, it must be read and registered, Jones explained. With hardware already developed by Calspan and manufactured by Rockwell International, Inc.'s Autonetics Division, a print can be read using a flying spot scanner and system that digitizes the ridge directional flow and minutiae locations.

Fics then classifies each fingerprint according to one of the 116 classifications established by the FBI's National Crime Information Center.

Fics then makes an overall numerical classification for the fingerprint card by designating the particular combination of classifications for the 10 individual prints on the card, Calspan said, and the print is stored in a data base.

Search and Matching Software

To match a new print against those already on file, the system reads and classifies the new print and then matches it against the data base using search and matching software also available from Calspan, Jones said. Thus the print need be searched only against those prints whose classification numbers indicate general similarity, Jones said.

While the prototypes of the Finder hardware still being tested by the FBI were built and delivered by Calspan in 1972, five production models were built for further testing by Rockwell International under a separate contract, Jones said.

By changing the card handler from a semiautomatic to an automatic model, the FBI-Rockwell production models work about three times faster than the prototype, Jones said.

Although the major difficulties of automated fingerprint identification have been overcome, the FBI is still testing and does not anticipate converting to an automated identification system before 1981 or '82, Jones said.

At present the FBI's fingerprint file contains 21.4 million fingerprint cards for individuals under the age of 80, Jones said. FBI officials do not intend to convert all these cards; plans call for reading and digitizing only those of individuals under 55 years of age, according to Jones, thus reducing the number that must be converted to 14 million.

Calspan Engineer Thomas L. Leising operates the firm's automatic Fingerprint Classifier System (Fics). After the print is read and digitized by a companion unit previously introduced by the firm, Fics locates the minutiae shown on the monitor and then assigns the print to one of 116 federal classifications for storage in a data bank.

"Hopefully we'll have a portion of the system up and running in about 1978," he estimated.

Although the FBI program is moving slowly, Calspan is forging ahead with a somewhat different system for large cities and state identifications bureaus that is said to be able to match latent fingerprints – those obtained from the scene of a crime.

Unlike the system designed for the FBI, Calspan's slower, smaller scale matcher does not require alignment of the two fingerprints being matched.

To match a fingerprint lifted from the scene of a crime, the Fingermatch system puts the latent print on a CRT screen where a technician traces the minutiae on the screen with a light pen.

This procedure takes from four to six minutes, a Calspan spokesman said, but once the print is drawn and coded, Fingermatch compares the new print against 10,000 prints – or 1,000 sets of 10 fingers each – in one minute, he said.

Since a city police department may have only 5,000 to 10,000 prints in its data bank, the print can be matched in a minute or two, he indicated.

The lifter portion of the system, consisting of the screen, light pen and a small processor, sells for $21,900. The search/match portion of the system is priced at $119,700, Calspan said.

In the Used Market–Part 2

Maintenance an Important Factor

By Sonny Monosson
Special to Computerworld

One of the most important factors a user must consider in a used computer transaction is the status of maintenance on the equipment slated for sale.

Self-maintenance is a rarity in computer usage.

Although maintenance alternatives are available from independent sources, the vast majority of computer users (except in the case of minicomputers) rely totally upon those services supplied by the original manufacturer and delivered under the terms of the standard, full-coverage maintenance agreement.

The manufacturer's common practice is to offer the maintenance agreement in support of the equipment itself, as opposed to support of the customer. The maintenance agreement is normally interpreted as being automatically extended to any subsequent owner, but must nevertheless be verified as a condition of sale.

Absolute Necessity

To date, transference of the maintenance agreement is an absolute necessity for purchase, and equipment offered for sale should be warranted for acceptance under a standard maintenance agreement.

The only way such a warranty may be obtained is to request it from the original supplier. The seller should request an inspection for resale purposes and a written statement from a responsible source (for example a branch manager or customer engineer) that such equipment is validated for continuance under a normal maintenance agreement in areas where maintenance service is otherwise supplied by the manufacturer.

The machine involved should be further certified as to the operability of all installed options (which may or may not be currently used) and the installation of all engineering change orders of a mandatory character normally provided as a portion of the maintenance agreement.

Reconditioning Needed?

Since reconditioning is not generally required (except for a few vendors) as a condition of maintenance continuity, the

(Continued on Page 28)

Forms Stacker Ends Bank Delays

NEW YORK – A forms-stacker device is easing the pressure on the DP section of Bankers Trust Co. here to get the checks that are deposited each day, along with their reconciled printout listings, to the New York Federal Reserve Bank by its deadline.

Bankers Trust must float, or cover out of its own funds, checks its customers draw against checks deposited from other banks until those checks have been deposited in the Federal Reserve.

"The object is to keep the float as low as possible. If we miss those deadlines because listings aren't available or the computer breaks down that's avoidable float. The extent to which float can be avoided is what the management of the section is graded on," according to Mike Menditto, the bank's check processing manager.

In July 1974, when the bank moved its operations center (through which all checks are processed) to a new installation and installed five Burroughs Corp. 9243 1100 line/min printers, a problem developed that threatened to cancel out much of the benefit of the new installation.

The new printers' higher speed, combined with the already high skip rates inherent in printing the check reconcilement listings, was causing the continuous fan-fold forms used to tangle and misfold. Delays were being caused in processing check listings and were particularly severe during critical peak periods.

Operators were spending 10 to 15 minutes per hour just folding and reorganizing the listing stacks as they came off the printer, Menditto said.

Installed Forms Checker

To solve the problem, Bankers Trust installed an adjustable Formstacker – a power-drive forms puller and stacker from Advanced Terminals, Inc. It installed one on a two-month trial basis and

(Continued on Page 28)

Test your information display I.Q.

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Imagine a microcomputer with all the [illegible]

Imagine a microcomputer supported by dozens of interface, memory and [illegible] that can be interfaced to an indefinite number of peripheral devices including [illegible] floppy [illegible] CRTs, [illegible] cassette recorders, video displays, paper tape readers, teleprinters, plotters, and custom devices.

Imagine a microcomputer supported by extensive software including Extended BASIC, Disk BASIC, DOS and a complete library of business, developmental and industrial programs.

Imagine a microcomputer that will do everything a mini will do, only at a fraction of the cost.

You are imagining the Altair 8800b. The Altair 8800b is here today and may very well be the mainframe of the 70's.

The Altair 8800b is a second generation design of the most popular microcomputer in the field, the Altair 8800. Built around the 8800A microprocessor, the Altair 8800b is an open ended machine that is compatible with all Altair 8800 hardware and software. It can be configured to match most any system need.

MITS' plug-in compatible boards for the Altair 8800b now include: 4K static memory, 4K dynamic memory, 16K static memory, multi-port serial interface, multi-port parallel interface, audio cassette record interface, vectored interrupt, real time clock, PROM board, multiplexer, A/D convertor, extender card, disc controller and line printer interface.

MITS' peripherals for the Altair 8800b include the Altair Floppy Disc, Altair Line Printer, teletypewriters, and the soon-to-be-announced Altair CRT terminal.

Introductory prices for the Altair 8800b are $840 for a kit with complete assembly instructions, and $1100 for an assembled unit. Complete documentation, membership into the Altair Users Club, subscription to "Computer Notes," access to the Altair Software Library, and a copy of Charles J. Sippl's Microcomputer Dictionary are included. BankAmericard or Master Charge accepted for mail order sales. Include $8 for postage and handling.

Shouldn't you know more about the Altair 8800b? Send for our free Altair Information Package or contact one of our many retail Altair Computer Centers.

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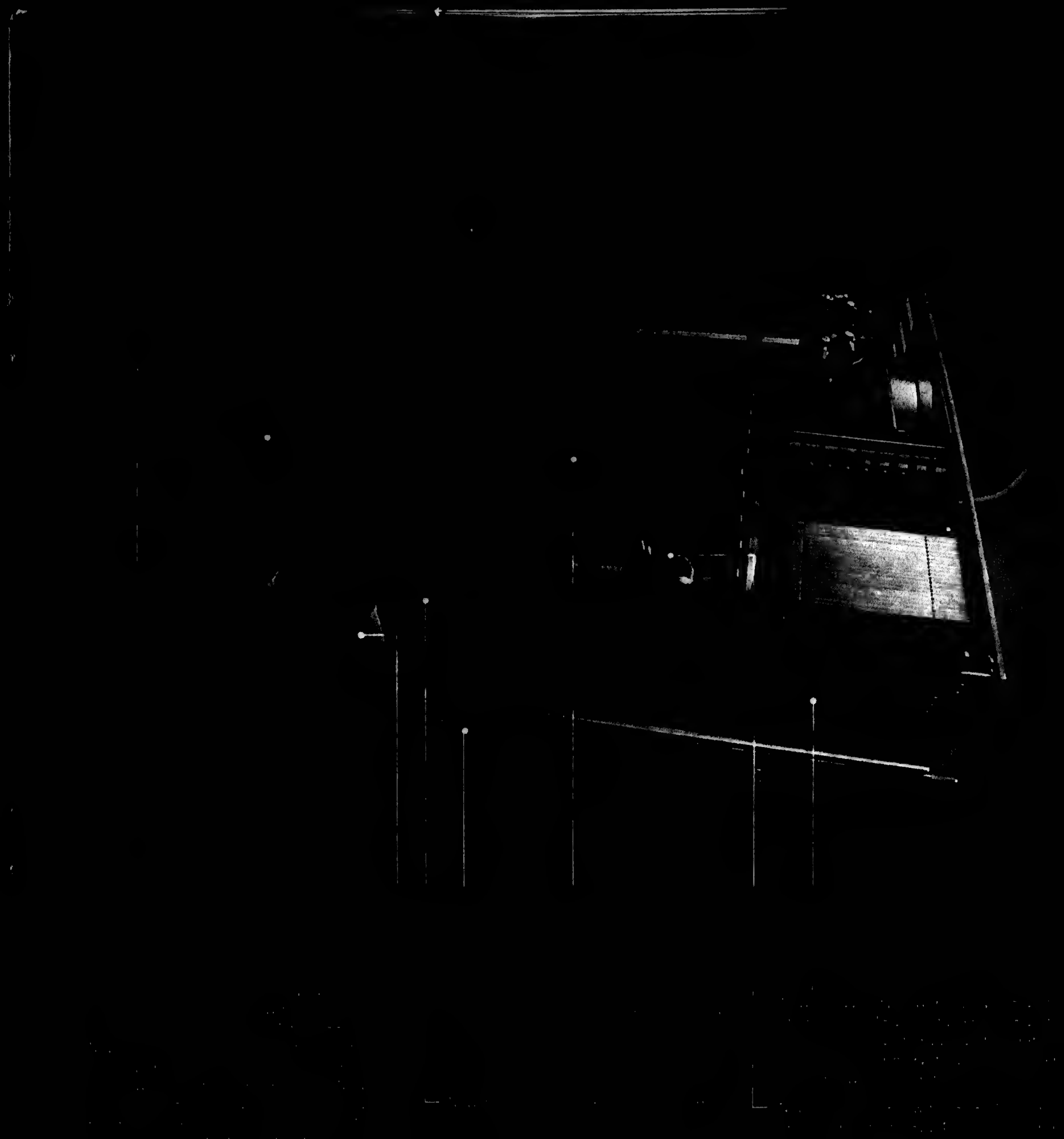

altair 8800-b

Interface Bows

ALTADENA, Calif. – The Kennedy Co. Model 1629 half-duplex interface is said to provide complete operational control without mainframe processing between Kennedy buffered tape systems or any RS-232C-compatible terminals and buffered transports.

The system allows off-line key-to-tape or tape-to-tape conversions via hardwires or telephone lines with modems at rates from 110 bit/sec to 19.2 bit/sec, the firm said.

Three transport/controller configurations accommodate varying remote collection requirements.

Tape speeds range from 10- to 125 in./sec, with 9-track data densities of 800- and 1,600 char./sec. Seven-track densities are 200-, 556- and 800 char./sec.

The Model 1629 is priced at $1,650 with volume discounts available from the firm at 540 West Woodbury Rd., Altadena, Calif. 91001.

Maintenance Important in Used Mart

(Continued from Page 25)

process may stop at this point. However, the seller should also solicit an estimate of reconditioning or refurbishing costs, in case the buyer is interested in this type of information.

The seller also should request an itemization of specific work required to bring the machine to the level of acceptability required by the maintenance agreement.

Reconditioning is not normally done prior to sale, except by equipment dealers, but is done, where required, at some point in the transfer from currently operative installation to a new user's installation.

The most convenient reconditioning services are those supplied by the original manufacturer, but several competitive reconditioning centers are now operated by independents.

The buyer sometimes opts for reconditioning, but the bulk of observed equipment transfers supported by the continuing maintenance agreement have occurred without it.

Where no significant overhaul is required, reconditioning sometimes occurs for purely cosmetic purposes. This is often a good time for factory (or field) installation of options and/or features desired by the new user.

Where the seller is not a current subscriber to his supplier's maintenance agreement, the situation is somewhat different, although the procedure is essentially the same. The same manufacturer contact should be made for purposes of obtaining an estimate for placing the equipment under a maintenance agreement.

The seller should likewise expect the estimate will be reasonably supplied by a reputable manufacturer who is potentially interested in future service revenues as well.

Should the hardware be deemed not acceptable for a future maintenance agreement or require very costly rework, the seller should solicit a detailed itemization of all work required for submission to an independent maintenance or reconditioning organization.

In summary, the seller must normally warrant to the buyer that the equipment is certified as eligible for a resumption of the manufacturer's maintenance agreement.

This generally poses no problem, since the only known cases where maintenance has been refused involve equipment for which maintenance services have already been expressly discontinued (a relatively rare phenomenon in the computer industry).

Every computer vendor treats maintenance continuity differently, and those who buy and sell used computer equipment should never assume a common industry practice exists – because in maintenance it doesn't.

Part III will discuss the methods a user has available to him to sell his equipment.

Monosson is a past president and now chairman of the Computer Dealers Association and is president of American Used Computer Corp.

Forms-Stacker Device Stops Bank Delays

(Continued from Page 25)

now has four.

"Its amazing so simple a piece of equipment could handle a problem that was driving us all up the wall," one operator said.

Formstacker operates by enabling forms leaving the printer to stack into a wire tray that lowers automatically as the forms fold in. A set of power rollers pulls the forms down through the upper part of the stacker, preventing printer jams, while rubber-covered "fingers" suspended by chains prevent the forms from billowing.

When forms reach a certain height, the next fan-fold in line trips a limit switch that indexes the tray downward. Thus, printout forms always stack at the same height level.

Automatic Alarm

An automatic alarm sounds when the tray is full and its open-sided design allows the operator to remove the printed stack from any of three sides. The unit can be moved from one printer to another to accommodate peak loads.

The key advantage of the four $1,000 units has been the ability to fully utilize the speed of its new printers in meeting check processing deadlines and cutting float to a minimum, Menditto said. Documenting time savings, operators claim operation of the four printers equipped with Formstackers is speeded by 20% at peak periods because of the elimination of misfolds and paper tangles.

The Formstacker units were also selected for their ability to cope with 1,800 line/min printer currently under consideration by the bank.

"If and when we go to an even higher speed printout operation, I have no doubt our Formstacker units will handle the load efficiently, Menditto said.

MDS Users Form in Capitol

WASHINGTON. D.C. – An independent society of Mohawk Data Sciences Corp. (MDS) users has been formed in the Capitol area to exchange hardware/software techniques and ideas on how to exploit the full capabilities of MDS systems.

Information on the Mohawk Users Group (MUG) is available from Barnctt, U.S. Erda, Mail Stop CA 145, Washington, D.C. 20545.

Our 3270 replacement: It's more than you bargained for.

A 45% cost saving is a bargain. But Computer Optics offers more. The CO:77 display terminal is a totally compatible replacement for your IBM 3270. And it offers a range of design features that you can't get from IBM. At any price.

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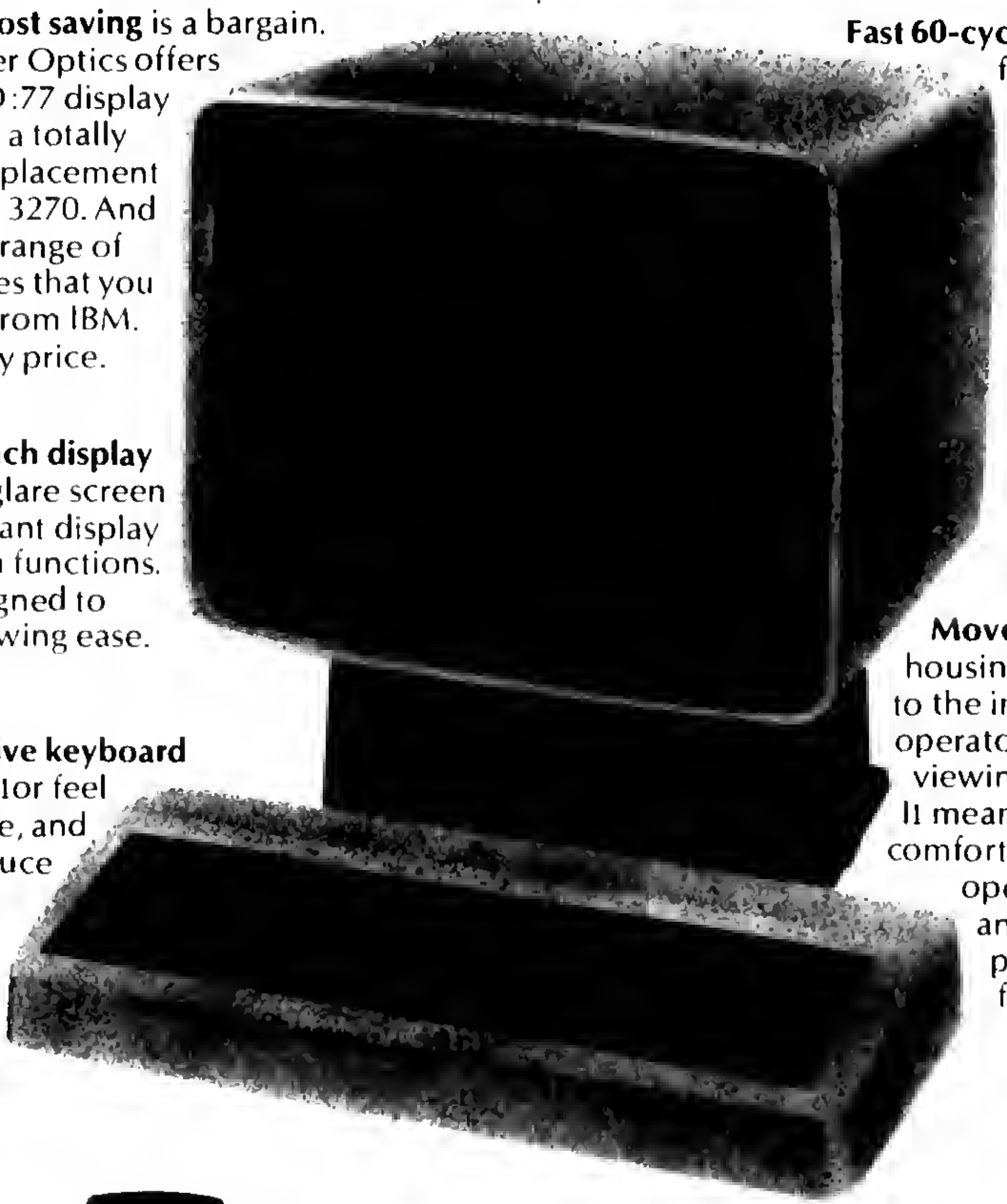

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Mini Bits

IEEE/CS Seeking Papers For November Symposium

TORONTO – A call for papers covering all aspects of minicomputers and microcomputers and their applications has been issued by the IEEE Computer Society (IEEE/CS).

The papers will be presented at a symposium here November 10-11.

A 200- to 250-word abstract should be submitted by September 1 to the symposium chairman. More information is available from Mini and Microcomputers, P.O. Box 3243, Station B, Calgary, Alberta, Ca. T2M 418.

Floating-Point Unit Fits 8080s

BERKELEY, Calif. – North Star Computers, Inc. has a floating-point arithmetic unit for Intel 8080-type microcomputer systems.

Consisting of a single printed circuit card, the unit performs add, subtract, multiply and divide on BCD-format floating-point values, with up to 14-digit precision under program control, the firm said.

The system costs $499 from the firm at P.O. Box 4672, Berkeley, Calif. 94704.

Cache Memory Works With PDP-11s

ST. PAUL, Minn. – The Minntronics Co., Inc. Model 45 cache memory was designed to be used with Digital Equipment Corp. PDP-11/45 and 11/50 minicomputers, according to the vendor.

The unit consists of three printed circuit boards and an optional power supply that plugs into available DEC Fastbus slots.

The Model 45 feaures an on-line switch as an aid in running benchmark tests as well as hardware checkout, Minntronics said, adding installation of the memory takes about 20 minutes.

The system is priced at $6,940 for a limited time. Minntronics is at 2975 Furness St., St. Paul, Minn. 55109.

HP Triples I/O Channels of 9825

PALO ALTO, Calif. – An I/O expander that triples the number of I/O channels available for the HP 9825 programmable calculator from three to nine has been introduced by the Hewlett-Packard Co. (HP).

The 9878A I/O expander has seven I/O slots and comes with a 6-ft. cable with an integral I/O card to plug into one of the three 9825 I/O slots.

Two of the expanders may be plugged into a calculator at once, the firm said.

The expander costs $1,200 from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Captures 'Original Keystroke'

Newspaper System Saving $628,000

By Esther Surden
Of the CW Staff

RALEIGH, N.C. – Two newspapers here said they have some news of their own to report: a minicomputer-based system is saving them more than $628,000 annually in operating costs.

"Our objective was to capture the original keystroke," Frank A. Daniels Jr., president of the News and Observer Publishing Co., said of the system which handles and stores all copy from its origin to final phototypesetting at the *News and Observer* and *The Raleigh Times*.

The company investigated several systems before choosing a Digital Equipment Corp. mini-based configuration because it was the "most flexible system available at the time we were looking," Daniels said.

Systems Functioning

The system "has been in-house for three years and functioning the way we want it to function for six or seven months," he added.

Fifty CRT terminals serve both of the newsrooms for local copy entry, editing and headline writing; eight more are used to set classified display advertising copy. Wire copy is also captured and joins the stream of jobs for editing and output.

So far the company has invested $1.2 million in equipment for editorial and typesetting functions. About $200,000 was spent for cold-type conversion and about $800,000 went for a DEC Typeset-11 system.

The Typeset-11 includes a PDP-11/45 CPU with 128K of main memory, magnetic tape, two 44M-byte disks, two line printers, interfaces for the wire services and 16 terminal subsystems.

The remaining $200,000 was invested in a PDP-11/45 for the business office. This machine can also act as a backup for the Typeset system.

It doesn't seem as though there is "ever a stop to it," Daniels said, referring to changes to be made to the system. For example, the reporters and editors would like more CRTs, and the company is thinking of expanding the system in the future. Additional CRTs will require a larger front-end system, he noted.

Much of the savings achieved by the conversion took place in the composing room, where a former roster of 101 foremen, typographers and technicians has dropped to 57, and in the proofroom, which now employes four full-time and three part-time proofreaders vs. 14 and three previously. Nearly all departures were accomplished through retraining and/or transfer, voluntary retirement or resignation, Daniels said.

Savings in Salaries

The current annual payroll saving from this change is estimated at $628,500; with a further drop to 40 composing room personnel expected by the end of 1977, the 1978 payroll savings will probably amount to $724,500, excluding new contracts or salary increases, he added.

Times reporters write local stories at the CRTs and queue them to the city desk for evaluation and editing. The city editor passes them, on queue, to the slotman who adds page, length and headline instructions to the files.

Copy editors call up the stories on CRTs, edit and write headlines according to the directions and queue the stories to a "backreader," or a final checkpoint. Upon his approval he types a simple command on his CRT that sends each story through justification and hyphenation and on to the phototypesetter.

At the larger *News and Observer*, stories follow a similar route, although more editors are involved and 10% of local copy is still written at typewriters.

The company faced a problem in supplying full electronic capability to both

(Continued on Page 30)

EAI Minihybrid for Simulation Combines Digital, Analog CPUs

WEST LONG BRANCH, N.J. – Electronic Associates, Inc. (EAI) has a small-scale, integrated hybrid computer system called Minihybrid for simulation purposes in educational, biomedical and industrial applications.

The system offers the I/O and stored memory of a digital unit and the high-speed parallel mathematical computation power of an analog processor, the company claimed.

Minihybrid has the ability to solve sets of up to 12 differential equations at the same time, a spokesman added.

The system processors are the EAI 185 parallel analog processor which features analog computational modules and analog and digital trunks and an EAI Datapacer digital processor with up to 32K words of 16-bit core memory, hardware multiply/divide, 64 priority interrupts and power fail protect.

The system features a hybrid communications interface with 60 analog/digital channels and a Teletype ASR-33-compatible teletypewriter for digital I/O.

The Minihybrid can be expanded to include an alphanumeric/graphic CRT, an X-Y plotter and additional digital, analog and interface capabilities, the spokesman noted.

Software for the system includes the Datapace operating system. A handbook provided with the unit details the principles of transforming equations into programs by interconnecting the necessary computing modules, EAI said.

The basic system with 16K digital processor, 133K floppy disk, EAI 185 parallel analog processor, hybrid communications interface and a teletypewriter costs about $35,000, the company said from West Long Branch, N.J. 07764.

16-Port Link-200 From Randal Designed for Business DP Users

TORRANCE, Calif. – The Randal Data Systems Link-200 system accommodates a maximum of 40M bytes of disk storage, 65K characters of memory and 16 ports for multiterminal time-sharing operation, the firm said.

The Link-200 is compatible with the other members of the firm's Link family and is programmed in Business Basic, the firm noted. It runs under the Randal Timesharing Operating System.

Application programs available for the Link-200 include accounting, payroll, word processing, text editing and inventory entry and control. Communications, remote job entry (RJE) and data entry packages are also available.

Also introduced with the Link-200 were industry application packages for the lumber industry and for medical or dental practice management.

A basic Link-200 system with 32K of memory, 10M characters of disk and a CRT costs $20,000 or can be leased for about $450/mo.

The system can accommodate printers with speeds of up to 600 line/min, printing terminals, 800- and 1,600 bit/sec magnetic tape, card readers and IBM, Univac and other vendors' communications/RJE packages, the firm claimed.

Randal is located at 365 Maple Ave., Torrance, Calif. 90503.

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Napacomp Turnkey Reduces, Analyzes Data

VALLEJO, Calif. – A turnkey minicomputer designed to analyze, reduce and display data and the functions of data is available from Napacomp Corp.

The mini, designed for industrial, laboratory and military applications, "looks at gross data," manipulates and takes the functions of data, fits curves to the data or function and analyzes it, the firm said.

Hardware for the system includes an Interdata 8/16 minicomputer with 65K bytes of memory, a moving-head disk, CRT, hard-copy unit and RS-232 interface.

An optional tape unit is "strongly suggested" for the system, a spokesman noted.

The basic system costs $54,000 including the tape unit and specialized software.

Some of the options available include additional disk, card reader and a plotter.

The system features control of all operations via input from the CRT/keyboard, on-line selection and/or algebraic transformation of data, on-line data base management editing capabilities and interactive control and specification of output data, Napacomp said.

The vendor is at 601 Sacramento St., Vallejo, Calif. 94590.

Disks Fit Nova

MOORESTOWN, N.J. – Tri-Star Computer Systems, Inc. has 40M-, 80M- and 300M-byte disk subsystems for Data General Corp. Nova minicomputers.

Included with each subsystem is a controller, drives, power supply interface and cables; up to four drives can be accommodated by each controller, Tri-Star said.

An 80M-byte subsystem costs about $17,000 from the company at 304 Harper Drive, Moorestown, N.J. 08057.

Wang Adds Word-Process Family

TEWKSBURY, Mass. – A family of microprocessor-based word-processing systems, the System 10, 20 and 30 has been introduced by Wang Laboratories, Inc.

The modular systems, configured in various arrangements of a CRT-based workstation, disk and 40 char./sec daisy-wheel printer, contain an Intel 8080 processor in each of the devices, according to a Wang spokesman.

The controlling microprocessor unit is located in the diskette unit and has a 16K memory associated with it, he added. The units are connected by coaxial cable, he noted.

The disk can store from 200,000 char. or 80 pages to 10 million char. or 4,000 pages, the firm said. The systems feature insert/delete/move instructions for characters, words, lines, paragraphs and pages. Operator prompts are displayed on the CRT.

Automatic half-spacing, page numbering, hyphenation, pagination, paragraph indent and centering as well as document merge are among additional features, Wang said.

A System 10 with a workstation, system diskette and 40 char./sec printer costs $12,000; the System 20 with workstation, system diskette, archive diskette and 40 char./sec printer costs $18,400; the system 30 with a workstation, 10M-byte disk, archive diskette and daisy printer costs $30,000 from Wang at 836 North St., Tewksbury, Mass. 01876.

System Saves $628,000 /Year

(Continued from Page 29)

the *News and Observer* and *Times* staffs while keeping newsrooms separate. The system supports a maximum of 32 terminals, and for a while the company faced a choice of combining the newsrooms or buying a second computer.

But, as Daniels noted, Raleigh's two papers, although under common ownership, thrive on a competitive spirit. "Separate news departments make for better newspapers," he said. "Physical separation keeps them honest and creates a sense of pride."

To permit installation of the extra 26 video terminals, production director Ivan Mims designed a switchboard to permit connection of CRTs in one newsroom when those in the other newsroom are not in use. Thus, when editorial deadlines pass for the *Times* and pairs of terminals are shut down, corresponding pairs in the *News and Observer* newsroom are placed on-line.

Editors claim the system's biggest advantage for them is in gaining time for breaking stories and having greater editorial control of the product, and Daniels agreed with them.

"We can handle a late story in a third of the time it took before," *Times* managing editor Michael T. Yopp said. "We have been able to get last-minute stories into print that we would have had to skip otherwise."

Lab's Mini Increases Gathering of Test Data Tenfold

SAN ANTONIO, Texas – A minicomputer at the Southwest Research Institute (SWRI) here is gathering 10 times more data with greater accuracy than is possible manually, the user said.

SWRI's engine laboratory, which tests lubricating oils and other automotive products, uses a minicomputer data acquisition and test-monitoring system to collect and log temperatures, pressures and speeds.

The system prints out summary plots and tabulations in real time. It also alerts operators to the parameters that threaten to violate specification range limits, according to a spokesman.

Engines Operate At Once

The laboratory's data acquisition system (DAS) administers the tests for oil and chemical companies. Any of 50 engines can be operated simultaneously to perform the eight different programmed qualification tests to army specifications, he added.

Should an engine parameter approach specification range limits, an alarm message is printed on the teleprinter and displayed throughout the laboratory via a closed-circuit television system, alerting the operator where manual adjustments must be made.

Alarm test specifications are set closer than the actual test specifications so an alarm message will occur before the value actually goes out of limits, he noted.

The automated laboratory is operated by a Hewlett-Packard (HP) 2100A real-time minicomputer system with 24K memory and various signal conditioning and scanning electronics for taking readings, as well as I/O peripherals.

Another HP 2100A minicomputer system with a 32K memory capacity digital voltmeter and scanner controller spares provides backup data storage and I/O facilities to the engine laboratory system while also servicing general-purpose and software development needs.

Other products evaluated here include hydraulic oils, additives, automatic transmission fluids, fuels, antifreeze compounds, tires and engine components.

The institute is also engaged in a variety of applied research and development covering several scientific disciplines – biomedicine, electronics, mechanics, chemistry, physics and social sciences.

The DAS contains capacity for 800 separate analog channels, allowing 16 sequential channels to each engine.

The DAS includes the HP 7900A disk subsystem with capacity for 2.5M words. Also part of the system are an HP 2748A tape reader, three HP 2640A keyboard display terminals and an HP 2754B teleprinter, the user said.

The channels are assigned to take readings of cooling water-out temperature, water-in temperature, oil temperature, intake air temperature, exhaust temperature, intake and exhaust pressures, oil and jet pressure and humidity.

Disk Formatter Supports 3330s

SUNNYVALE, Calif. – Ball Computer Products has a microprocessor-based disk formatter subsystem with a minicomputer interface for disk drives using IBM 3330-type technology, the firm said.

Features of the Model 3300 disk formatter include the supporting of record formats in variable sizes, internal data encoding and decoding, error correction and a first-in, first-out (Fifo) buffering technique that matches disk speeds to minicomputer timing, the company said.

The 3300 accommodates up to eight spindles in a daisy-chain arrangement, Ball said. The formatter's microprocessor permits seek overlap operation, it noted.

The format technique allows standard minicomputer fixed-sector recording of any size; IBM-compatible variable-length record format can also be implemented, Ball said. The error-correction code is compatible with IBM code, the firm added.

The 3300 costs $5,000. Ball is located at 860 E. Arques Ave., Sunnyvale, Calif. 94086.

Pharmacy Turnkey Based on Reality CPU

JENKINTOWN, Pa. – Health Care Computer Systems, Ltd. has a turnkey minicomputer pharmacy system designed for retail pharmaceutical consultants, hospitals and nursing home druggists, according to the firm.

The system keeps track of drug interaction and patient histories and offers a financial and billing subsystem.

Based on a 16K Microdata Reality minicomputer, the system includes 5M bytes of disk, a CRT, tape drive and 165 char./sec printer.

Users communicate with the system through local or remote terminals, the firm said.

The basic system costs $40,000 and software is licensed for $15,000. The company is located at Foxcroft Sq. Apartments, Jenkintown, Pa. 19046.

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NCR Extends Adds Contract For Another Three Years

HAUPPAUGE, N.Y. – NCR has extended for another three years its OEM contract for teletypewriter-compatible CRTs from Applied Digital Data Systems, Inc. (Adds).

The value of shipments to NCR between 1977 and 1980 should exceed $40 million, Adds predicted.

The Adds System 70 intelligent terminal is not included in the OEM agreement, but negotiations are being conducted concerning this product, Adds said.

The terminal maker estimated it will have shipped about $18 million in terminals to NCR by year-end 1976.

Wescon Nears Sellout

LOS ANGELES – Wescon/76 is nearing oversubscription despite advance planning to be about one-third larger than last year's sellout show.

There will be 725 exhibit units on the floor when the show opens its 25th "silver celebration" at the Los Angeles Convention Center here Sept. 14.

Bunker Ramo Realigns

WESTLAKE VILLAGE, Conn. – Bunker Ramo's Electronic Systems Division has integrated its marketing function with Program Management and Advanced Programs.

The realignment will provide more effective orientation to customer requirements and markets as well as a more practical environment for marketing equipment, according to Francis J. Cunningham, president.

Oil Industry's Use of DP Growing

PALO ALTO, Calif. – Computer services expenditures by oil companies will amount to $96 million in 1976 and will more than double by 1981, according to a recent analysis by Input.

Total DP expenditures in the oil industry will amount to about $1.8 million in 1976.

ADR Acquires Upjohn Scheme

The Upjohn Co. has agreed to sell to Applied Data Research, Inc. (ADR) the rights to a scheme it developed that allows in-company interactive execution of user programs previously processed on outside time-sharing services. Upjohn said the technology being sold increases the versatility of ADR's Roscoe.

By Bundling Leased Systems

IBM Stinting Maintenance Mart: Vaughan

By Edith Holmes
Of the CW Staff

NEW YORK – If users who lease equipment from IBM could select their maintenance vendor as those who have purchased systems from the corporation have been able to do since 1969, a whole new market area in the computer industry would open up, according to the former president of an independent maintenance company.

Appearing as a recent witness on behalf of the U.S. government in the trial of its antitrust case against IBM, Comma Corp.'s ex-president, James Ray Vaughan, said he would consider IBM's further unbundling, or separate pricing, of maintenance services advantageous to the marketplace.

He added he could not see how unbundled maintenance would have an adverse effect on IBM's leased computer systems and suggested there must be other ways for the corporation to protect its financial investment in leased systems.

If IBM were to unbundle its maintenance services and charge its leasing customers for these services, the corporation would probably have to monitor third-party maintenance companies for their parts quality, to inspect equipment maintained by third parties on a regular basis and to have performance bonds to which third parties would have to adhere, he speculated.

Vaughan, now general manager of engineering services marketing for Control Data Corp. and once an IBM employee, stated he believes IBM continues to bundle maintenance services where leased systems are concerned in order to protect its assets.

In addition, IBM gains valuable feedback on accounts from those charged with maintaining its systems, he said.

'Option of Selectivity'

An independent maintenance organization like Comma, which was acquired by CDC in 1973 and merged with that company last August, can provide users with "an option of selectivity" by permitting some choice in who maintains their systems, Vaughan said.

The selectivity option works in Comma's favor, too, because the company can decide what equipment it wants to service, he noted.

One of the few independent maintenance vendors, Comma does direct its efforts toward the maintenance of IBM computer systems, particularly the 360 models 30 through 65. But the company also handles equipment made by some peripheral companies and marketed by some leasing firms, Vaughan said.

For leasing companies, Comma offers a financial incentive in the form of the ownership credit in exchange for the chance to maintain their machines. For peripheral firms, Comma serves as a single maintenance source with its "call us first" policy, Vaughan said.

If a peripheral company is willing to pay a "triggering fee," Comma will begin business in a new area where the peripheral maker needs service for his equipment and want to develop markets, he added.

(Continued on Page 34)

FTC Charges TRW, AM Violated Clayton Act With Dual Director

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – The Federal Trade Commission (FTC) has charged TRW, Inc. and the Addressograph Multigraph Corp. (AM) with violating the Clayton Act, which prohibits interlocking directorships between competing corporations.

Both firms have denied the allegation and deplored the investigation of a "moot" point.

The FTC alleged the antitrust law was violated when TRW's chairman, Horace A. Shepard, also served on AM's board between Jan. 1, 1973, and Nov. 6, 1975.

During that period the "business of TRW and Addressograph included, but was not limited to, the manufacture, sale and distribution in commerce of point-of-sale, credit authorization equipment and teller-opeated bank transaction equipment," the FTC complaint stated.

"By nature of their business . . . and location of operations with respect thereto, Addressograph and TRW were competitors, concurrent with respondent Horace A. Sheperd's membership on the boards of directors of TRW and Addressograph," the FTC stated.

In its suit, the FTC is seeking to bar TRW and AM from having any common directors with each other or any of their competitors and to bar Shepard from serving simultaneously as a director for any competing firms.

"TRW vigorously denies there has been any illegal interlocking directorships between it and AM. Further, the allegation that TRW and AM manufactured and sold competing products while Mr. Shepard served as a director of AM is false," according to a TRW spokesman.

"TRW intends to take all possible action to contest the complaint," he added.

AM 'Thoroughly Dismayed'

A spokesman for AM said that company is "thoroughly dismayed" not only by the issuance of the complaint, but by the "superficial manner in which the investigation was conducted, by the commission staff's disregard for conscientious efforts

(Continued on Page 34)

Sycor Sues IBM for Infringement

CHICAGO – Sycor, Inc. has filed suit against IBM charging infringement of a patent covering source data entry terminals and methods of implementing such equipment.

In the action, filed in the U.S. District Court here, Sycor is seeking judgment against continuation of IBM's alleged infringement and an award of damages.

The complaint does not, however, state a specific amount for damages or refer to the specific patent number, an IBM spokesman said.

IBM is "confident we have not infringed on Sycor's patent," he added.

The patent in question is No. 3760375 according to Sycor. It is directed to data entry equipment, intelligent terminals in particular, which employ microprocessors to control the operation of a plurality of peripherals.

Sycor is not actually seeking damages but rather a royalty, according to Herbert S. Amster, Sycor vice-president of finance.

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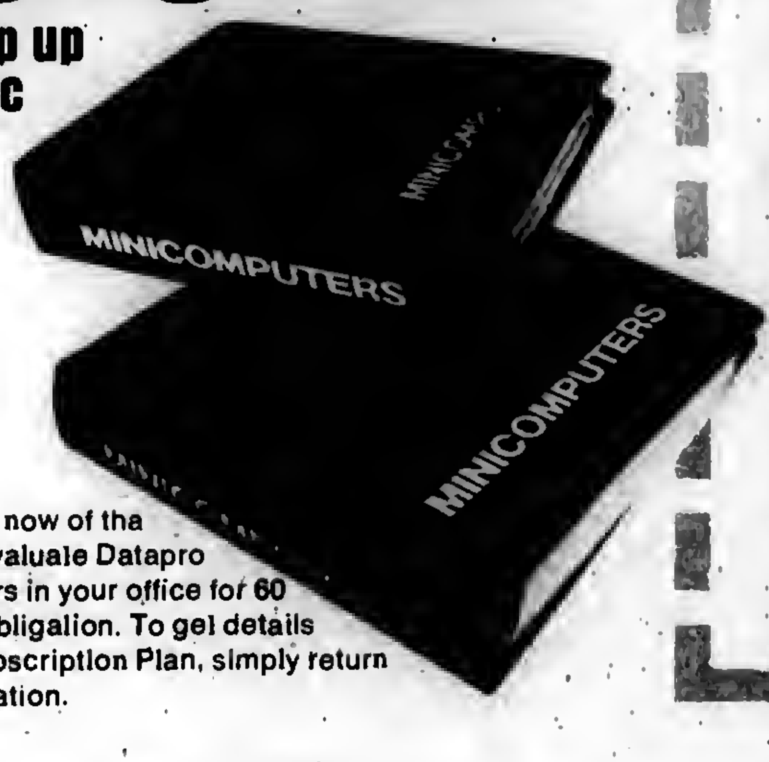

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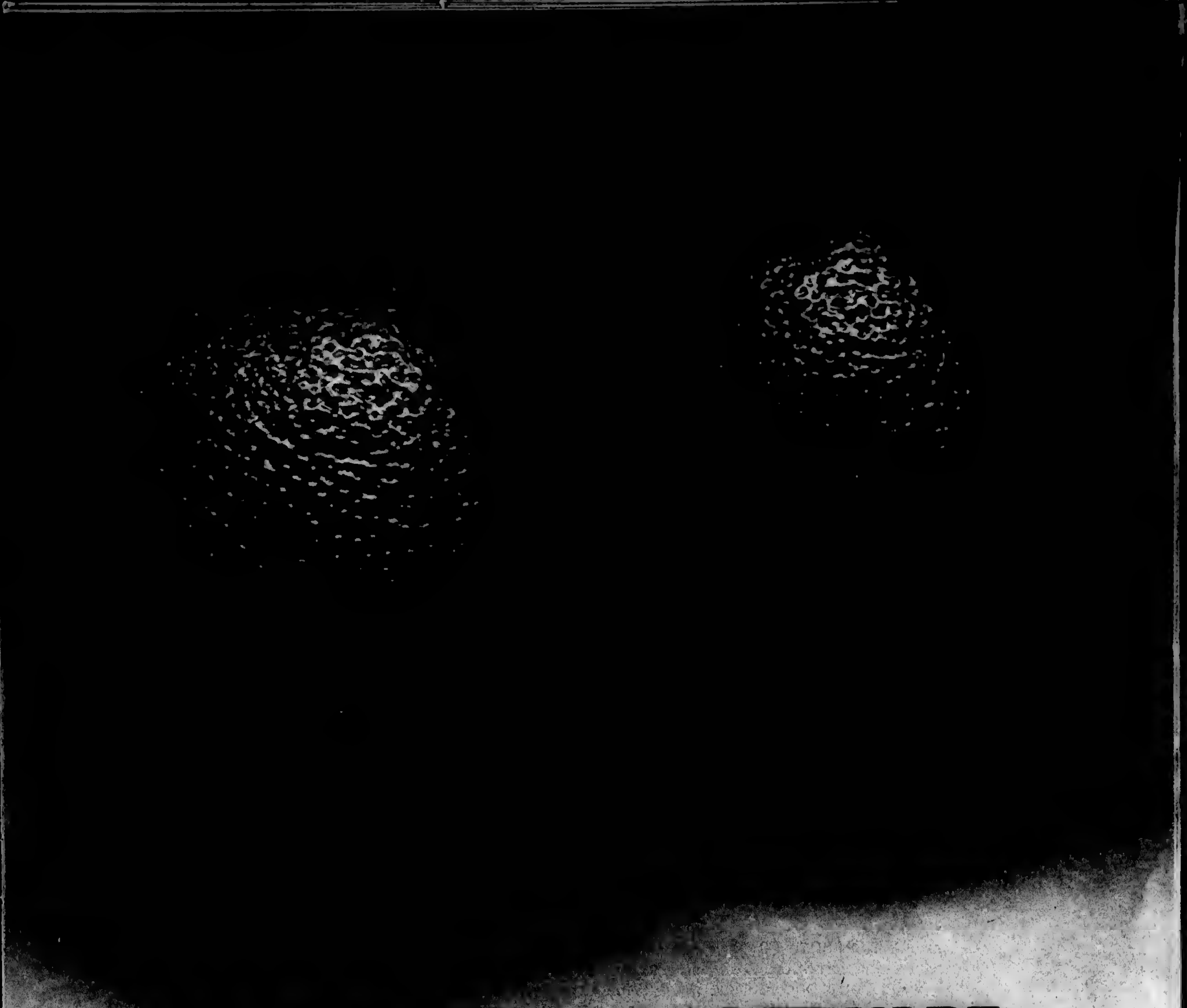

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IBM Bundling Seen Restricting Maintenance Market

(Continued from Page 32)

Comma generally prices its maintenance services on purchased IBM systems at 20% below IBM prices. In 1970-71, Comma achieved approximately 80% of the maintenance revenue gained by IBM for servicing 360 products, Vaughan said.

Comma has to obtain parts from IBM as well as from the vendors of the peripherals it services. While IBM does not offer a discount on parts, it has permitted Comma to acquire parts, IBM service manuals and engineer assistance with little difficulty, Vaughan said.

IBM "has done an excellent job in answering parts requests" and often "treated comma better than it did its own people," he added.

Many of Comma's customer engineers have come and continue to hail from IBM, lured to the independnet maintenance company for better pay, he said.

Differences With 370s

The former Comma president said the company had tried to follow the same pricing policy with respect to the 370 systems as it has with 360 machines only to find the 370 marketing environment substantially different from that of the 360:

Unlike IBM policies for 360s, features or particular hardware options could only be added to 370s by IBM personnel at the time of installation. Comma could no longer demonstrate its maintenance ability to customers by installing extra IBM features, Vaughan said.

To a certain extent, Comma had been closed out of maintaining 370s because IBM had come to consider these features and their installation company confidential information, Vaughan suggested. IBM had chosen to include in the 370s themselves the basic hardware needed to make engineering changes and considered proprietary the knowledge needed to activate those changes.

In addition, IBM provided users of 370 equipment with remote diagnostic capabilities in the hopes of "retaining" 370 systems. This diagnostic system contained the latest IBM engineering changes, but Comma didn't gain ready access to these changes and to the "symptom fix file" – a file of known historical problems on the machines and the best fixes available to them – until March of this year.

Finally, Vaughan stated, the Fixed Term Plan affected Comma's ability to sell its services to 370 users since purchased 370s carried with them one free year of maintenance, thus giving Comma one year less of product life in which to serve the customer.

Not Cause of Comma's Problems

At the time of CDC's acquisition of Comma in 1973, the maintenance the company was offering suffered from severe problems, but questioning by lawyers for IBM indicated the industry leader was not directly the cause.

Vaughan testified Comma had tried to train its own people on 370s rather than obtain engineers from IBM, but a management reorganization stalled marketing efforts to develop 370 maintenance business and so delayed the adequate use of these people.

Comma also had trouble automating its accounts and accounting system. For a time it could not rely on its accounting data; it had problems with its invoicing system that resulted in outstanding costs tht had to be borne in 1974.

The company could not estimate its revenue from month to month within a 10% tolerance, and inaccurate invoices make it difficult to collect on bills, Vaughan said.

Since its merger with CDC a year ago, Comma has continued its efforts to enter the 370 maintenance market, Vaughan said.

TRW, AM Charged On Clayton Act

(Continued from Page 32)

by AM and others to place pertinent information before it and by the commission's decision to devote its time and federal funds now on a matter that has been entirely moot for several months."

Shepard, he noted, has not served on the board of AM since 1975.

AM firmly believes there was no competition between the two firms during Shepard's directorship, he added.

"However, even if Amcat credit authorization terminals were in competition with certain TRW products as alleged by the FTC, it would have been so inconsequential as to be meaningless under the law . . . since revenues produced by the sale of Amcat terminals in that fiscal year amounted to only 26/100 of 1% of AM's total revenues," the spokesman said.

AM further contended the FTC's regional office in Cleveland ignored an offer by AM to provide pertinent and detailed explanatory information and proceeded to request that the complaint be issued.

Hearings will be held Aug. 24.

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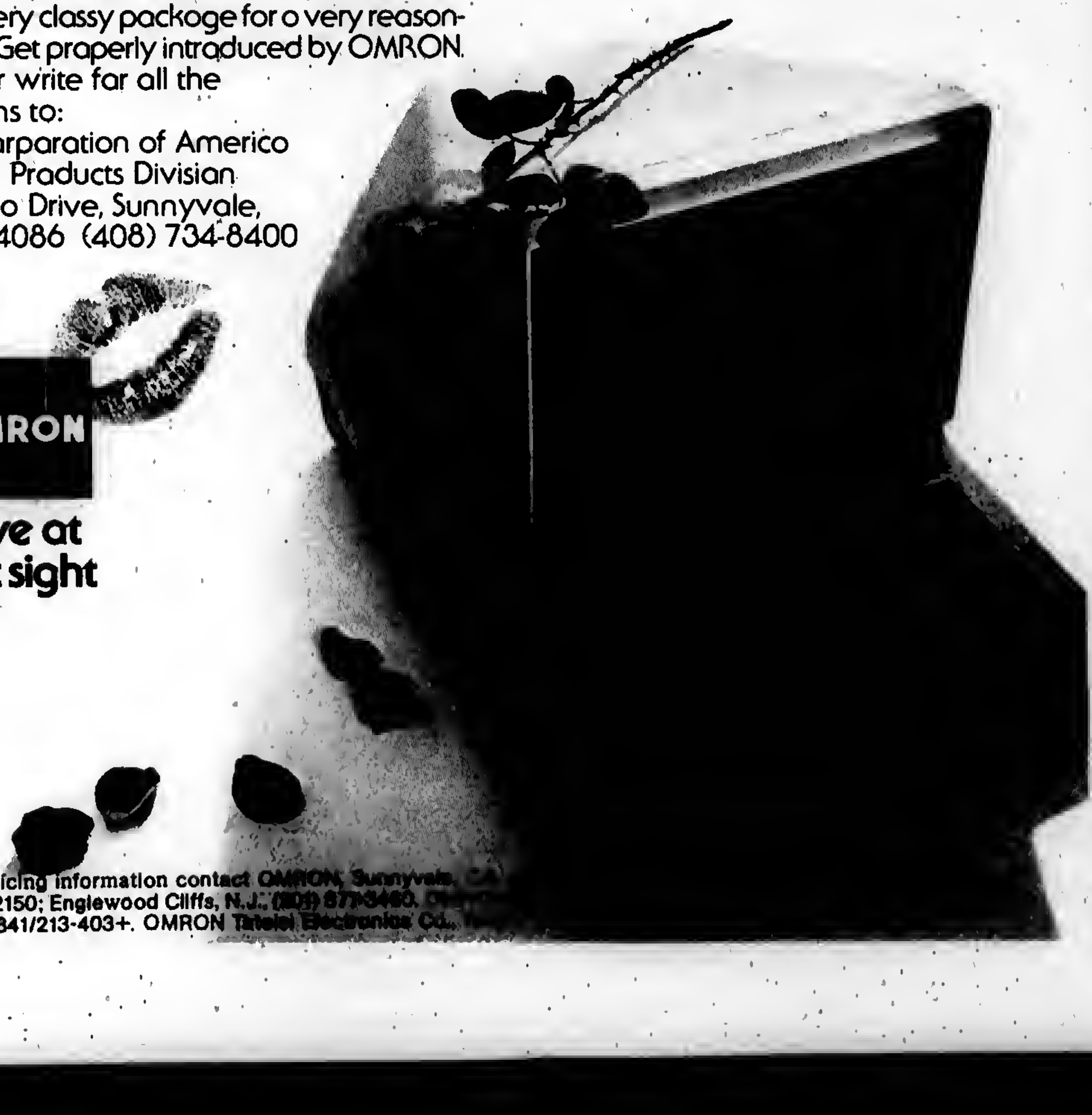

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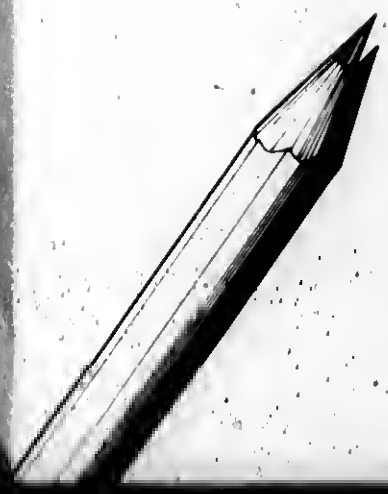

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CIRCULATION DEPARTMENT

Says Industry Not Too Fragmented

Cadapso Sees No Need for Government Intervention

By Toni Wiseman

Of the CW Staff

TORONTO – The Canadian services industry is well equipped to meet that country's future needs and there is no justification for government intervention, the Canadian Association of Data Processing Service Organizations (Cadapso) said in a brief submitted to the Department of Industry, Trade and Commerce (ITC).

The privately owned computer services companies "have demonstrated an ability to grow with the needs of users and have significantly exceeded average rates of industrial growth," Cadapso stated.

The brief made five major recommendations aimed, according to Cadapso, at improving government understanding of the services industry's concerns.

The brief asked ITC to recognize the "unique" position of the industry, to support taxation policies "which will contribute to the viability" of the industry and to lend its support to Cadapso's position on such legislative matters as the revision of the Bank Act.

The Canadian computer services industry is not excessively fragmented and it is natural that the companies are concentrated in central Canada, where there is the greatest demand for DP servcies, Cadapso told ITC. And, the brief noted, telecommunications makes physical location questions irrelevant.

About 25 companies account for 75% of the total industry revenues, thereby achieving a relatively more substantial dominance within their industry than their U.S. counterparts, Cadapso said.

"There is a basic contradiction in the expressed desire to see a reversal of so-called fragmentation and, at the same time, an increase in the number of companies operating central computing facilities in the regions outside central Canada," the brief added.

"The natural play of the free market will bring about the desired rationalization of the industry while at the same time meeting those service market opportunities existing in eastern and western Canada.

"Any attempt to interfere with natural economic conditions will inevitably produce distortions and therefore should not be undertaken," Cadapso warned.

The top 25 Canadian service companies have grown at a rate of 35% compounded annually from 1970 to 1974 and have shown the ability to "grow with the needs of the users."

The brief also noted deterrents to the growth of the services industry in Canada, such as the 30% capital cost allowance. The allowance is "a step in the right direction," but makes it difficult for Canadian companies to compete with U.S. firms because the U.S. cost allowance rate is 40%.

Unfair competition from banks, Bell Canada and "casual" service participants such as universities and private industries pose a threat to the industry's viability, the brief noted.

International News

Software in Canada Gets Full Depreciation

OTTAWA – The Canadian government has issued a new federal budget which provides for a 100% capital cost allowance on software.

It also provides an increase from 20% to 30% in the depreciation allowance for computer hardware.

It was previously believed all software development could be expensed for tax purposes and software was therefore not regarded as a capital item.

In January, however, the Department of National Revenue issued an interpretation of the existing law which suggested software was a capital item and had to be depreciated on a company's books at a rate of 20% declining balance.

This would have had a depressing effect on software sales because it would have resulted in increased tax payout at the time of acquisition or development of major software, according to the Canadian Association of Data Processing Service Organizations (Cadapso).

As a result of Cadapso's efforts, the government came out with the revision which stated that, while software was indeed a capital item, it could be depreciated fully in the year of development.

1976–78 Pakistani Market Seen Limited for U.S. Gear

WASHINGTON, D.C. – Pakistan offers a limited market for office machinery and equipment, with total imports between 1976 and 1978 estimated at $10 million, according to a report from the U.S. Department of State.

The U.S. market share has remained relatively low and is not expected to rise above 10% in the next three years, mainly because of relatively higher prices and the import of machinery and equipment through European and British subsidiaries of the U.S. companies, State said.

Typewriters comprise the largest single component of total imports of office machinery and equipment. In 1974, typewriter exports to Pakistan were valued at $1.3 million, while computer exports for the same year were only $463,324.

Recent technological developments in areas of capital intensive production of microcircuitry have regained a competitive price and quality advantage for U.S. minicomputers, the report stated.

The State Department further noted that while the projected market for microcircuitry products in Pakistan is not large, Pakistanis tend to develop very strong brand loyalty and therefore the long-term market justifies an effort on the part of U.S. manufacturers.

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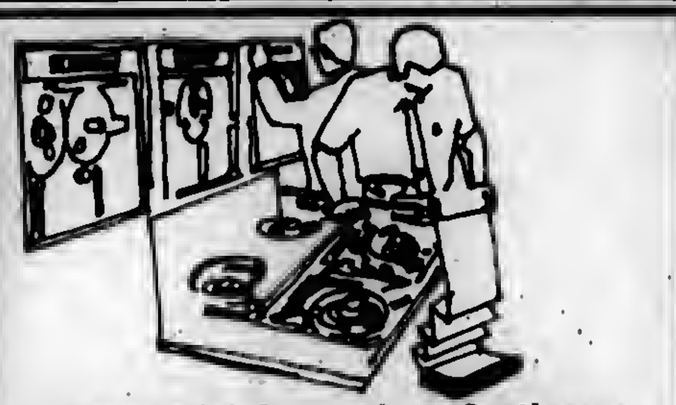

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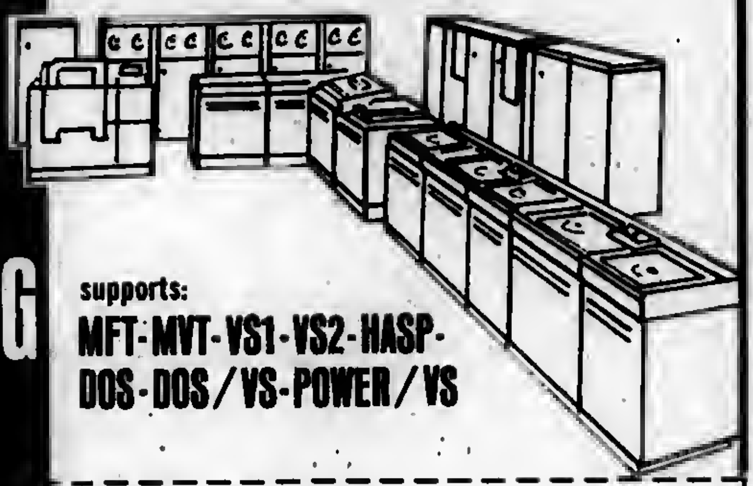

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CA Says Syfa Does Not Herald Abandonment of OEM Business

By Esther Surden
Of the CW Staff

IRVINE, Calif. – Although Computer Automation, Inc. (CA) is entering the commercial distributed processing arena with the introduction of the Syfa system, the firm will continue to make and market its OBM "naked" products, according to Philip Kaufman, director of corporate product planning.

"We are not abandoning" the OEM line nor "are we turning the direction of the company," Kaufman said in a recent interview here.

The Syfa system is the first product to come out of the firm's Commercial Systems Division. The division also makes the Syfa Information Station CRT, which will only be sold with the Syfa systems.

Natural Progression

The commercial system is a natural progression for the firm, according to D.H. Methvin, CA's president. "We built our corporate base on doing one thing and doing it very well in supplying computer equipment in volume to sophisticated customers," he said.

"We consider our Commercial Systems Division a logical adjunct to what we have been doing, and we are now ready to attack its market after eight years of building our strengths in products, management, service, finances and marketing in other marketing areas.

"We feel that these two divisions [Commercial Systems and OEM] will enable us to grow et a greater rate in the industry than if we had limited ourselves to just one segment," Methvin said.

The trend toward distributed processing in the industry is clear, Kaufman continued. His definition of distributed processing includes multiple computers communicating with each other with a disbursed data base.

"You cannot take all of your problems and put them in a large sack," he said.

A problem with distributed processing is convincing the person who has run a traditional DP shop and his users, who are comforteble pessing a stack of cards through e window, that distributed processing is the way to go, he noted.

The Syfa system will be marketed and sold through a totally different sales force, Kaufman added, to selected potential customers.

Takes Systems Approach

As for the other segment of CA's business, the firm will continue to "take the systems approach," Kaufman said.

"In the OEM business, the key to getting the market is to be able to interfece" to eny company's I/O devices, Kaufman said.

CA has attacked the I/O problem in the last year, producing interfaces that are small processors and easily implemented, he added.

The trend toward microcomputers was noted by Kaufman, who said "we don't really compete with microprocessors." The boundary between minis and micros is "mushy," he said, but "not as mushy es some people think. When you add a chassis, power supply and make the system easy to interface, then the line becomes more blurred.

"A lot of people who heve used micros and got burnt" are headed back to minicomputers because they offer systems, Kaufman said.

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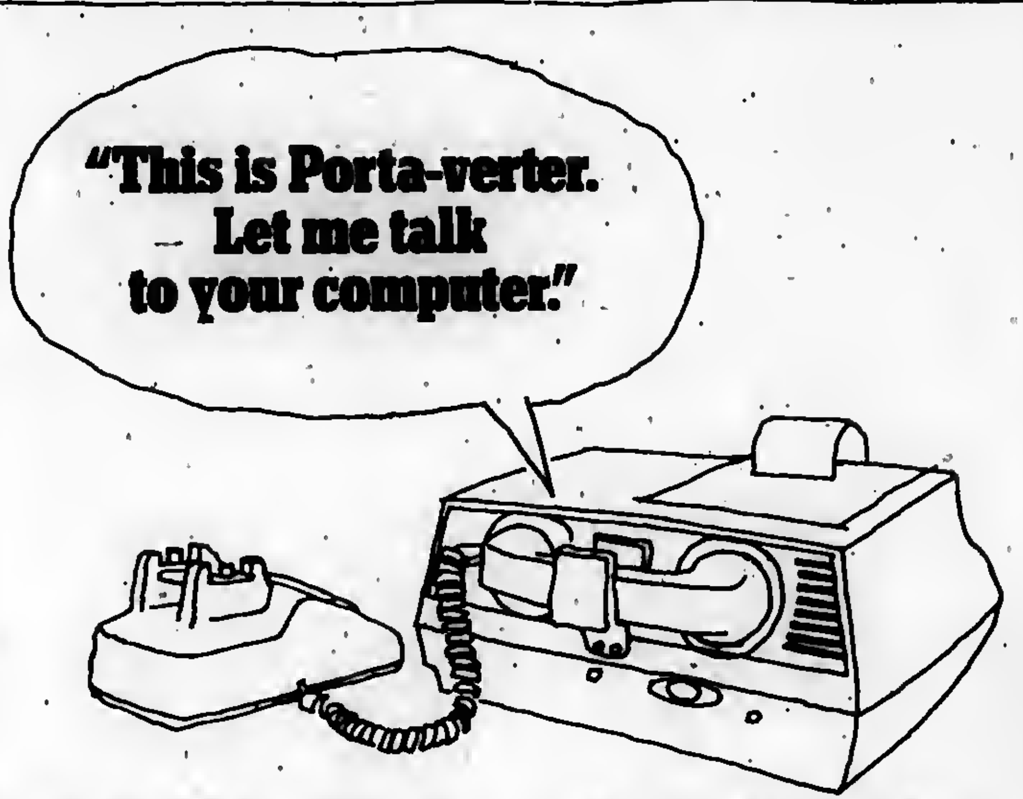
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Hi-Line Settles Suit Against Singer, IMA

DALLAS – The Singer System Ten is out and an NCR Century 101 is being installed at Hi-Line Electric Co. following settlement of Hi-Line's suit against Singer [CW, April 2, 1975] and an interim period with an NCR 8200.

Although Hi-Line's President J.P. Schaeffer indicated he wasn't happy with the settlement, he said the agreement was made under duress from his wife.

He had previously suffered a nervous breakdown and was scheduled to go out of the country over the Christmas holidays, so settled before he left, he explained.

"However, if I had it to do all over again, I would have taken them right on" through trial, and "if I'd had a fair trial I would have won, without a doubt," he said.

The firm installed an NCR 8200, but its growth rate was faster than anticipated becuase it started a new division. NCR then suggested a 101, he said.

Further, NCR is giving Hi-Line full credit on the 8200.

"NCR has been most fair and most decent with us. I have no complaints with it whatsoever. It has tried real hard," he said.

Hi-Line had filed suit against Singer Information Management Associates, Inc. (IMA), charging them with fraudulently representing the capacity and capability of the System Ten, for which IMA was to supply the programming.

The firm never received the CRT or accompanying software for this aspect of the system and returned the system in August 1973, a year after it had signed the lease agreement.

Orders & Installations

Exxon Co, has ordered for lease a Trace data capture system and two high-speed sorters from Recognition Equipment, Inc. for installation in its credit-card processing center.

American Management Systems has ordered an IBM 370/155 to double the capacity of its computer center.

Mellon Bank of Pittsburgh has ordered an Incoterm Series 7000 on-line banking system for installation at its headquarters and in over 100 branches in western Pennsylvania. The equipment is valued at over $5 million.

The U.S. Air Force Avionics Laboratory has installed four high-speed digital computers from Westinghouse Electric Corp. for an avionics "hot bench" facility which is part of the U.S. Air Force Digital Avionics Information System program.

Sirong's News Agency, a magazine distributor in Arizona, has ordered a 90/30 system from Univac for distribution, general accounting, billing, payroll and other business applications.

Hinky Dinky Stores of Omaha, Neb., has ordered Datachecker electronic point-of-sale systems for three stores from National Semiconductor Corp.

Retailers Electronic Account Processing, Inc. has ordered 100 Source 7600 programmable accounting terminals from MSI Data Corp. for use by independent retail soft goods stores for computerized accounting and billing of their own charge-card customers..

The Asbury Park Press of Asbury Park, N.J., has ordered a T-410 publishing system from Tal-Star Computer System, Inc. for on-line processing of classified advertising, wire service and news copy.

Continental Oil Co. has ordered a Control Data Corp. Cyber 172 system, valued at nearly $3 million, to aid in its search for producible reserves of oil of natural gas.

European-American Banking Corp. of New York, has ordered a Trace check-processing system for lease from Recognition Equipment, Inc.

Cherry Creek School District Number 5 in Englewood, Colo., has installed a Burroughs B1726 system for administrative functions and hands-on training of students.

Rockingham National Bank of Harrisonburg, Va., has purchased a U-COM computer output microfilm system from U.S. Datacorp.

The *Peoria Journal Star* has ordered a Series 2500 copy-processing system from Harris Corp.'s Composition Systems Division. The system will include 16 Harris 1500 editorial terminals, four 2200 display advertising layout terminals and two 7400 Fototronic phototypesetters.

The U.S. Army has installed an IBM 360/50 at Presidio, Calif., under a contract with Dearborn Computer Leasing Co.

The Nevada Industrial Commission has installed Adabas from Software AG on the State of Nevada Central Computer Facility to develop the Workmen's Compensation Policy and Claims System.

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University of New Hampshire has an immediate opening for an experienced systems programmer with a minimum of 5 years experience on large-scale, time-sharing system, 3 years of which must be in operating systems work, or equivalent combination of education and experience. Responsibilities include monitor generation and maintenance, performance analysis, and operating system modification. Experience with DEC system-10 highly desirable. If you meet the qualifications, please send resume by August 31 to:

Mr. Richard Schofield
University of New Hampshire
Computer Services, Kingsbury Hall
Durham, New Hampshire 03824
An Equal Opportunity/Affirmative Action Employer

DIRECTOR TECHNICAL SALES

Continue your career on the forefront of Computing and Computer Networking as part of the overall role of the IUPUI Computing Services Division.

Responsibilities include analysis, design and implementation of applications projects, consultive and client services, and systems software development.

Major equipment at Indianapolis includes a DEC-10 (KL) and an IBM 360/44; major equipment also accessed includes a CDC 6600 and an IBM 370/158 in Bloomington. (The DEC, CDC, IBM systems are part of the eight-campus Indiana University Computing Network.)

The section's professional, technical and clerical staff numbers approximately twenty-five and supports diverse activities from the academic community of this 20,000-student campus and medical center.

Qualifications: Graduate degree preferred (Medical/Math/Science) plus a successful supervisory and managerial experience in computing of at least five years.

Send Resume and Salary History to:

INDIANA UNIVERSITY PURDUE UNIVERSITY at INDIANAPOLIS
Personnel Office
1100 West Michigan St.
Indianapolis, Ind. 46202
An Equal Opportunity Employer M-F

Data Processing (Administrative) — Manager: professional position responsible for computing facility; for supervision of staff of twelve; for planning, budgeting, scheduling, programming. Burroughs B-3500. Applicant must have B.A. in computer science, mathematics, or equivalent major; 3 to 5 years experience in programming, including COBOL; administrative and managerial experience. Experience in Systems Analysis desirable, knowledge of IEP helpful. Salary range: $14,800 - $18,850. Final offer and salary contingent on State Budget approval. Send letter of application, resume, five references to Vice President for Administrative Services, State University of New York College at Brockport, Brockport, New York 14420. An equal opportunity, affirmative action employer.

INFORMATION SYSTEMS and COMPUTING
3 Management Positions

Director—Division of University Information Systems

responsible for development of multi-year Administrative Information Systems plan for University coordination of policy making, policy implementation, planning and plan implementation for University administrative information systems — experience in managing large organization, technical competence in computing and systems planning.

Director—Division of Information Management

responsible for developing central administrative information systems plan, coordinates central management information needs assessment and the collection and provision of information for central planning, policy-making, management direction and control, and reporting — management experience and competence in management analysis, organizational planning, systems analysis.

Director—Division of Computing

responsible for operation of two central data processing centers and coordinates planning, resource allocation, evaluation and review of University computing facilities — management experience and competence in computer technology, networking, data processing operations.

$26-35K, Experience in academic institution preferred. Send resume by 8-15-76 to Bernard Sisco, Acting Special Assistant to the President, 881 University Hall, University of California, Berkeley, 94720. *Equal Opportunity, Affirmative Action Employer.*

Jacuzzi

Corporate growth, recent hardware upgrade and data communications plans necessitate data processing staff expansion for this major manufacturer. Excellent opportunity for able, energetic individuals who seek a professional career in data processing. We offer outstanding fringe benefits and opportunity to advance on demonstrated performance. Salary commensurate with qualifications and experience.

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Responsible for all program development for manufacturing information systems. Supervise a programming staff of four and maintain all systems software. Maintain and develop data communications software for on-line systems.

Candidates must have at least a Bachelor's degree and five years programming experience. COBOL background and teleprocessing experience on Burroughs hardware highly desirable.

SYSTEMS ANALYST

Responsible for analysis, design and implementation of manufacturing information systems. Participate in corporate long-range planning and policy and procedure development.

Candidates must have at least a Bachelor's degree and three to five years working experience in systems design. Teleprocessing design experience on Burroughs hardware also highly desirable.

Send resume, including employment history, salary requirements and interview availability to:

PERSONNEL MANAGER

Jacuzzi Bros. Inc.

11511 New Benton Highway
Little Rock, Arkansas 72203
An Equal Opportunity Employer M/F

PROGRAMMER/ PROGRAMMER ANALYST

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SYSTEMS/PROGRAMMING ANALYST

3-5 years systems & programming experience of which 1-3 years should be in life & health insurance. Strong COBOL and OS background necessary.

PROGRAMMER/ANALYST

1-3 years systems & programming experience using COBOL under OS. Life insurance experience preferred, but not necessary.

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The St. Paul

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We specialize in the banking industry and have immediate positions available for experienced individuals. IBM DOS COBOL or Banking applications experience is our prime requirement. Please direct your inquiries or resumes to:

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Oklahoma City, Okla. 73102
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Affiliates in 8 major U.S. cities including Hawaii
(Fees 100% paid by company)

COLORADO STATE UNIVERSITY

CSU is seeking Senior Systems Analysts and Analyst/Programmers to contribute to state-of-the-art research and development activities at CSU. Required are an M.S. in Engineering, Mathematics or Computer Science and at least six years experience in the data processing field with project-oriented developmental work in engineering simulation or modeling. Applicants should have experience with a wide range of systems, software languages and hardware mainframes. Present Computer Center resources include a CDC 6400 and CYBER 172, supporting batch, RJE and TS; graphics and microfilm. CSU, with an enrollment of 18,000, is located in a rural setting at the foot of the Rockies. Refer applications, including salary history, to Thomas McCall, University Computer Center, Fort Collins, Colorado 80523.

*An Equal Opportunity/
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DATA PROCESSING MANAGER

Data processing manager wanted to head up data processing for physician's clinic in north central Wisconsin. Applicant should have experience with Burroughs medium systems, and M.I.S. including on-line systems data communication and data base management. Prior programming experience desired. Competitive salary with exceptional benefits and living conditions. Please send resume including salary history to: Personnel Manager, Marshfield Clinic, 1000 North Oak Ave., Marshfield, Wis. 54449. *Equal opportunity employer M/F.*

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Ask for Loretta
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SYSTEMS PROGRAMMER RESEARCH ANALYST

The St. Paul is seeking minicomputer Systems Programmer with Assembler language experience to participate in Operating System and communications research and planning for Datapoint minicomputers.

Position offers attractive salary and a comprehensive benefit package. Convenient downtown St. Paul location. For further information call 1-800-328-9480, or send resume to: Employee Relations Department

St. Paul Fire and Marine
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The St. Paul

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Coordinator of Time-Sharing Services

Western Illinois University has an immediate opening for an MICC Coordinator. MICC (Mid-Illinois Computer Cooperative) is a co-operative time-sharing network serving 5 major Illinois universities. Duties include consulting with students and faculty concerning software problems, conducting user training seminars, developing new applications, and representing WIU at Coordinator meetings. Minimum requirements include a bachelor's degree in Mathematics, Statistics, Computer Science, or a closely related field (master's degree preferred), expert knowledge of several languages (FORTRAN a must), working knowledge of applied statistics, experience with time-sharing, and 2-3 years of related experience, preferably in a university environment. Knowledge of SPSS and CDC hardware and software a plus.
This is a 12-month, administrative position. Salary to $18,000.
Send resume and references to: Mr. Tate Lindahl, Computer Center, Western Illinois University, Macomb, Illinois 61455, (309) 298-1177.
Deadline for applications: August 27, 1976

*An Equal Opportunity/
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SYSTEMS PROGRAMMER

- MVS experience highly desirable.
- Familiarity with OS internals essential.
- Computer science degree or 2 years experience.

INTERNATIONAL SOFTWARE SUPPORT

(Princeton-based)

- Responsible for software product support and training.
- Extensive international travel (over 50%).
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- COBOL required (1-2 years).
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Applied Data Research, a leader in the software products industry, is expanding its professional staff and offers challenging career opportunities with growth potential.

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SPO, Personnel Director*

APPLIED DATA RESEARCH

Route 206 Center, CN-8, Princeton, N.J. 08540
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National Software Support Manager

If you have been debugging operating systems software problems for at least 5 years and can point to 3-4 years of solid line management or project leader experience in a software environment, we can offer you the opportunity to become the National Manager of our Field Engineering Software Technical Support Group.

You will be responsible for the software debugging of new and existing products, interfacing with hardware and software development groups, as well as researching and analyzing field software problems. You will recruit, train, and motivate highly sophisticated software specialists. This position will be of particular interest to you if you desire to maintain your own state-of-the-art technical expertise.

When you are selected for this position you will be working for a well-known, aggressive mini-computer company.

Send your resume complete with salary history, in confidence to **CW Box 4732**
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An excellent salary, paid benefits, plus room to advance your career are just part of what we have to offer you. To find out more, send your resume in confidence to:

Personnel Department-C OR CALL: (516) 589-6300

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American Management Systems is a nation-wide computer systems consulting and software development firm with over 225 employees with headquarters in the District of Columbia, with regional offices in New York, Chicago, Detroit, and San Francisco. We provide computer systems design and implementation services to many of the country's Fortune 500 firms, state and local governments, and federal clients. Areas of work encompass municipal finance, personnel/payroll, retail merchandising, inventory management, accounting systems, hardware/software analysis, and proprietary software development.

We have the following positions available in our Arlington and Chicago offices:

- JUNIOR PROGRAMMER/ANALYSTS — A Bachelor's degree in computer science or a related discipline or two years of relevant programming experience. Knowledge of COBOL and OS/JCL is required.

- SENIOR PROGRAMMER/ANALYSTS — junior level requirements plus three years of detailed design and implementation experience. Some exposure to teleprocessing software and/or packaged data base management software is desirable.

- DATA BASE SOFTWARE SPECIALISTS — same requirements as for Senior Programmer Analysts, plus hands-on experience with one of the major DBMS packages (IMS, ADABAS, TOTAL, System/2000). Positions available for both analytical work (hardware/software requirements analysis) and implementation projects.

- SOFTWARE DEVELOPMENT — same requirements as for Senior Programmer Analysts plus hands-on experience with mini computers.

We provide an exciting and challenging environment, rapid growth and professional advancement, and excellent salary and benefits. If you would like to join us, please send your resume (no calls, please) with salary requirements, past and current employment, education, and employment objective (if you have a geographical preference, please so indicate) to:

Fred L. Forman
Director of Professional Recruiting
American Management Systems, Inc.
1515 Wilson Boulevard
Arlington, Virginia 22209

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programmers

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DALLAS
Data Processing Careers, Inc.
Suite 1109
Stemmons Tower West
Dallas, Texas 75207
DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202
FLORIDA
Data Sciences Personnel, Inc.
Suite 205
15490 N. W. 7th Avenue
Miami, Florida 33169
HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105

LOS ANGELES
TeCS, Inc.
3440 Wilshire Boulevard
Suite 1007
Los Angeles, California 90010
MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1716
Minneapolis, Minnesota 55402
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New York, New York 10017
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Consultants for Employment
1046 E. Wendover Ave.
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106 Lawyers Building
428 Forbes Avenue
Pittsburgh, Pennsylvania 15219

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Providence, Rhode Island 02905
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San Francisco, California 94111
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CFA Associates Personnel, Inc. (Agency)
2530 James Street
Syracuse, New York 13206
TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2628 East 21st Street
Tulsa, Oklahoma 74114
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Suite 210
1211 Connecticut Avenue NW
Washington, D.C. 20036

DATA PROCESSING

FRENCH LANGUAGE CAPABILITY FOR ALGERIAN ASSIGNMENT

Major U.S. consulting firm under long term contract with the Algerian government has September and October requirements for EDP personnel experienced in IBM 370, Honeywell, Burroughs, Xerox hardware and specializing in ANS-COBOL/Fortran 4. Openings include needs for:

PROGRAM MANAGER
EDP MANAGERS or SUPERVISORS
SENIOR and JUNIOR ANALYSTS
SENIOR and JUNIOR PROGRAMMERS
TELECOMMUNICATIONS EXPERT
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HARDWARE EUVALUATION EXPERT
TRAINING SPECIALISTS
(EDP PLANNING, LANGUAGES, MANAGEMENT DISCIPLINES, HARDWARE, SYSTEMS)

Senior classifications require 10 years experience minimum, junior classifications 5 years experience. Candidates must possess Bachelor's Degree, MBA or equivalent desirable. French language facility a plus. Successful candidates will be located in Algiers for periods of 1 to 2 years with option to extend. Interviews will commence immediately. Remuneration commensurate with qualifications plus overseas allowance plus other benefits. Please provide a complete detailed resume including current earnings to:

CW Box 4728
797 Washington St.
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Systems Programmers

University of Iowa Computer Center has openings for computer programmers experienced in IBM OS/MVT/HASP or CDC CYBER/KRONOS operating systems internals and assembler language. Masters degree or equivalent experience required.

R & D PROJECT LEADER — requires extensive experience in computer operating systems design and internals. Additional experience in minicomputer operating system design is desirable.
$15-18,000 per year.

SR. SYSTEMS PROGRAMMER — requires extensive experience in operating systems internals. Experience in teleprocessing, performance monitoring, and/or DBMS internals is desirable.
$14-17,000 per year.

SYSTEMS PROGRAMMER II — requires assembler language experience. Experience in operating systems, interactive systems, and/or teleprocessing is desirable.
$12-14,000 per year.

Submit resumes by August 23 to:
University of Iowa
Computer Center
Lindquist Center for Measurement
Iowa City, Iowa 52242
Attn: Mr. Lee Shope
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Data Processing Opportunities

DATA BASE SOFTWARE ANALYST

We have a challenging position in our technical services area which requires detailed analysis and maintenance of data base software and procedures. Consulting with application programmers relative to data base design and programming techniques for effective utilization of DB software is also involved.

The successful applicant should have:

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Personnel Department

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(502) 589-8857

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PH.D. or equivalent with teaching responsibilities in COBOL, Fortran, structured programming, systems analysis, data base techniques, and access methods and data structures. Rank and salary depending on qualifications. Submit resume postmarked no later than Nov. 15, 1976, to: Dr. Robert H. Holland, Head, Dept. of Operations Research and Information Systems, College of Business, Eastern Michigan University, Ypsilanti, MI 48197.

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Programmer Analyst

If you're a problem solver, ready for independent responsibility, you'll find the challenge and opportunity you want with this major NYC educational publisher.

Responsibilities include: new programming for bibliographic processing and maintenance of existing programs complete with coding, testing and documentation.

Qualifications: Bachelor's degree or equivalent, a minimum of 1 year computer utilization in problem solving, and knowledge of COBOL plus Assembler language. Bibliographic data experience desirable.

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THE UNIVERSITY OF MICHIGAN
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$16,000-$20,000 Challenging position for qualified individual to supervise operations of a county wide data processing system. Bachelor's Degree in accounting, data processing or related field plus 4 years experience is essential. Forward resume to Personnel Administrator Pasco County, P.O. Drawer 609, Port Richey, Fl. 33568.

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(405) 525-8833

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Positions require ability to work with diverse Public Health Program areas in conducting systems feasibility studies; developing specifications for use by programmers in a State Data Center; developing testing methodologies to assure responsive design and installation, and conducting post-systems evaluation. The positions are located in Lansing, Michigan. A Bachelor's Degree with three or more years related work experience or a combination demonstrating ability is required. Salary range is $13,175 to $17,601. Social Security Number is a necessity. Send applications to: Recruitment, Dept. of Civil Service, P.O. Box 3002, Lansing, MI 48913, *An EOE*

PROGRAMMER ANALYST

Three years' experience in analysis and programming using COBOL and DOS/CICS required. BAL experience desired. Salary Range: $12,948-$15,792 per year plus excellent fringe benefits. Apply: The Metropolitan Community Colleges, 560 Westport Road, Kansas City, Missouri 64111 (816) 756-0220.

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COMPUTER PROCESS CONTROL ENGINEER

We offer a unique opportunity for an Electrical/Electronics Engineer to coordinate and supervise both the design and application of real time computer systems utilizing sensors for all functions.

Qualified applicants will have a master's degree in Computer Science or at least five years experience with servo systems for process control utilizing A to D and D to A converters with real time computer control and process optimization.

We are a major gravure printer and offer an excellent compensation and fringe benefit package and, most importantly, career growth opportunity.

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797 Washington St.
Newton, Mass. 02160
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Programmer

COBOL PROGRAMMER ANALYST

Minimum 3 years experience on IBM 370 equipment DOS/VS. Emphasis on business applications necessary. College degree preferred. Please forward resume to:

J. T. WYLIE
J.E.
SIRRINE CO.
ENGINEERS
P.O. Box 5456
Greenville, S.C. 20907
(803) 298-6597

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TEAM76

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Memorex Project '76 Team
Memorex Corporation
San Tomas at Central Expressway
Santa Clara, CA 95052

CW

Name____________________
Address____________________
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Employer__________ Years Experience______

HARRIS CORPORATION

Data Communications Division, a concept oriented leader in data communications, the fastest growing segment of the computer industry, seeks the following Professionals:

Systems Analyst

Baltimore Area

Requires 4 years experience with ASSEMBLY level development. Several ASSEMBLY languages are desirable. Will be responsible for mini-computer software development, custom applications and support.

Computer Hardware Sales

Pittsburgh, Chicago, Dallas, New York City

You should have computer equipment sales experience and a thorough knowledge of data communications. Our products include: communication processors, remote batch and conversational terminals . . . all with a wide range of interface and operational modes.

For our Divisional Headquarters in DALLAS, we seek :

Systems Programmers and Software Support Specialists

You should have a degree and two plus years ASSEMBLY language Systems Programming experience in one or more of the following areas:

- Operating Systems
- Source Data Entry/Inquiry Response Syst Systems
- Data Communications
- Preferably in a synchronous communications environment

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To provide Product Marketing support including competitive analysis and market forecasting. Position requires 3-5 years software and applications experience in the Data Entry and Distributed Processing market. Field Marketing and/or Marketing support experience preferred.

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You will develop and coordinate high quality sales and programming classes, adapt and implement class content and instructional techniques. Knowledge of operating Software Systems, OS, COBOL, and some sales background preferred.

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To teach remote batch maintenance to Field Engineers. The successful candidate will be knowledgeable in the techniques of instruction and will have maintained computer equipment.

At HARRIS, you will be working with TOP communications specialists in a highly technical environment for a company large enough to afford you the opportunity to learn and grow, but small enough to insure that your personal achievements will be recognized and rewarded.

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HARRIS COMMUNICATIONS AND INFORMATION HANDLING

HARRIS CORPORATION Data Communications Division

P.O. Box 44076 Dallas, Texas 75234

OR call him COLLECT at: (214) 620-4191

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SYSTEMS PROFESSIONALS

CNA, an imaginative and innovative insurance organization is installing a $26 million IBM 370 computer system that will be the most modern in the insurance industry and seeks several key systems professionals. We prefer individuals who are dedicated to career advancement and desire to be involved in the development of state of the art systems and applications. We operate in a MVS 158MP/168MP, IMS, TSO, RJE environment and seek:

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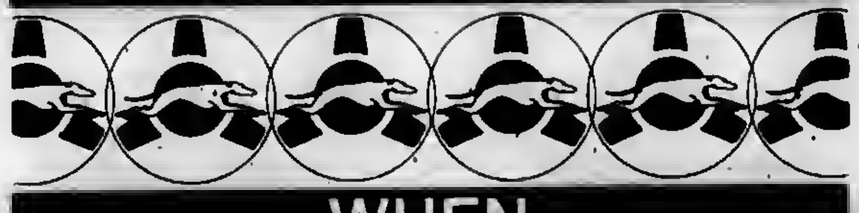

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AT&T Expects 'Very Good' 1976

NEW YORK – AT&T will have a "very good" 1976, according to its chairman, John D. deButts, who cited improvements in Western Electric's earnings, AT&T's operating ratio and strong expense control as well as a reduction in the national rate of inflation.

The earnings of Western Electric, AT&T's manufacturing arm, "are improving and should be considerably better this year than they were last year," deButts said in a recent interview with the *Wall Street Journal*.

Bell's economists are forecasting national economic growth at 6.6% this year compared with a decline of 2% last year. The figures include the change in gross national product after adjustment for inflation.

The economists see the 1976 inflation rate cooling off to 5.8% compared with 9% last year, deButts said.

AT&T's operating ratio improved to 63.7% for the first five months this year compared with 65.3% a year ago, he added. The operating ratio is the portion of operating revenue needed to cover operating costs.

The firm's "expense control is better than it has ever been," deButts said. "We've really got a handle on this."

As an example of the "strong" budgeting system instituted, he noted the units last year began making five-year budgets.

Also, AT&T is initiating a "functional accounting" system that is expected to break out costs on such items as repair at customer premises.

AT&T intends to be competitive in private line communications and customer premises equipment, deButts said, through changes in rates and business practices if necessary.

CSC Doubles Quarter Net

EL SEGUNDO, Calif. – Computer Sciences Corp. (CSC) reported earnings more than doubled in the first quarter ended July 2.

Earnings jumped to almost $3.29 million or 23 cents a share compared with $1.52 million or 11 cents a share in the 1975 quarter.

First-quarter results included a special credit of $750,000 arising from the carryforward of a 1972 net operating loss.

This extraordinary credit is expected to continue in the remaining three quarters of the current year, the firm said.

Revenues in the quarter rose to $55.5 million from $50.4 million in the year-ago period.

The results "represent a continuation of CSC's strong earnings growth over the last three years," according to William R. Hoover, chairman and president.

Revenue growth accompanied by higher profit margins from operations and by a reduction of $250,000 in federal income taxes resulting from the commencement of a four-year amortization period for a $3.9 million investment tax credit carryforward contributed to the increase in quarter earnings, he added.

EMM Quarter Earnings Up Tenfold As Firm Erases Loss in Half-Year

LOS ANGELES – Electronic Memories & Magnetics Corp. (EMM) reported earnings for the second quarter were ten times those of the year-ago period despite a slight drop in revenues.

Figures for the six months reflected the same trend with earnings taking the place of a loss although revenues fell.

Earnings for the quarter were $1.3 million or 20 cents a share compared with $134,000 in the year-ago period.

The 1976 earnings included a $710,000 tax credit from loss on the sale of a subsidiary.

Revenues totaled $22.3 million compared with $25.2 million in the 1975 quarter.

The half-year earnings rose to $5.4 million or 92 cents a share, including an after-tax gain of $3.7 million on the sale of about one-half of EMM's holding of Sycor, Inc. common stock and the $710,000 tax credit.

This compared with a loss of $260,000 for the same six-month period in 1975.

Revenues for the six months were $43.2 million compared with $48.8 million in 1975.

EMM reported new order input continued strong for core and semiconductor memory products, with sales during the second quarter up 8% over the first quarter, and order backlog increased by over 10% from the beginning of the year.

Applied Magnetics Net Rises 75% in Quarter

GOLETA, Calif. – Applied Magnetics Corp. reported earnings for the three months ended June 30 of $421,000 or 10 cents a share, a 75% gain over the $240,000 or 6 cents a share in the same 1975 period.

Revenues for the quarter totaled $16.05 million compared with $14.99 million in the year-ago quarter.

Nine-months earnings rose to $842,000 or 20 cents a share, a 68% increase over the $502,000 or 12 cents a share in the same period of 1975.

Revenues for the nine months slipped to $45.62 million compared with $46.94 million in the prior year.

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Request for Proposal No. 261 for the lease or pur chase of a mark sense reader system for processing answer sheets to be used in the Missippi State Department of Education Statewide Standardized Testing Program.

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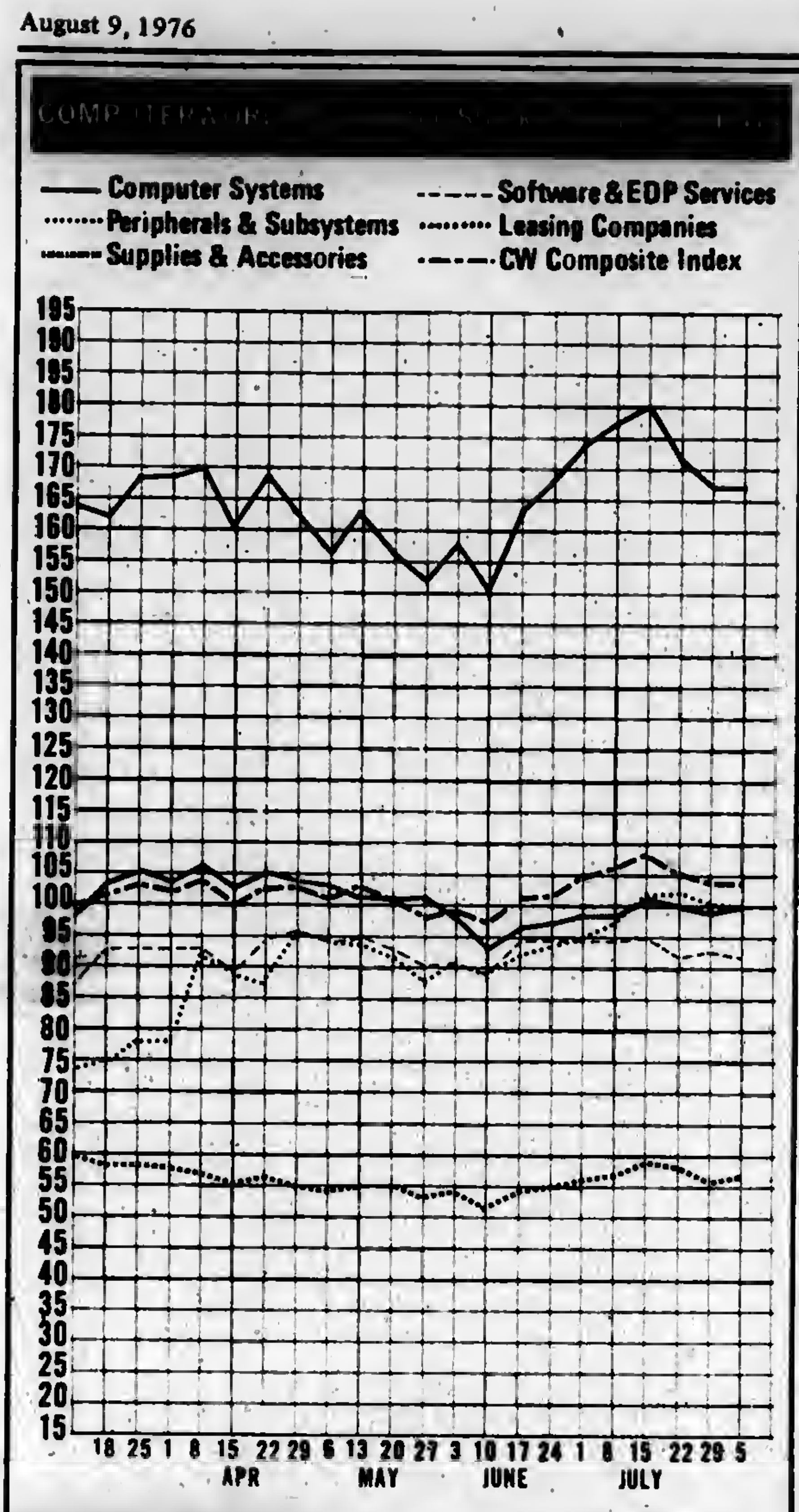

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Three Months Ended March 31

	1976	1975
Shr Ernd	$.04	$.02
Ravenue	10,899,172	10,031,989
Earnings	187,964	138,829
8 Mo Shr	.08	.05
Revenue	20,219,277	20,166,951
Earnings	385,777	271,811

COMPUTER NETWORK
Year Ended March 31

	1976	1975
Shr Ernd	$1.02	.....
Revenue	8,890,677	$3,821,947
Tax Cred	641,780	8,000
Earnings	1,330,519	(389,563)

COMPUTER USAGE
Three Months Ended March 31

	1978	1975
Shr Ernd	......	$.19
Ravanua	$2,048,887	1,235,184
Tax Cred,	......	55,500
Earnings	(96,456)	153,235
8 Mo Shr	......	.42
Revenue	4,005,534	2,387,969
Tax Crad	......	137,500
Earnings	(273,598)	327,088

COMTEN
Three Months Ended March 31

	1978	1975
Shr Ernd	$.05	$.02
Ravenue	5,390,000	3,532,000
Tax Cred	40,000	25,000
Earnings	127,000	54,000

DECISION DATA COMPUTER
Year Ended Nov. 29

	1975	1974
Shr Ernd	......	$.40
Revenue	$39,679,000	40,807,000
Tax Crad	......	722,000
Earnings	(8,417,000)	1,511,000

OIGITAL COMPUTER CONTROLS
Three Months Ended May 31

	1976	1975
Shr Ernd	$.32	$.06
Revenue	4,848,149	2,339,393
Earnings	495,725	89,462

ELECTRONIC ASSISTANCE
Three Months Ended April 30

	1978	1975
Shr Ernd	$.18	.....
Revenue	9,484,000	$7,828,000
Disc Op	......	(23,000)
Tax Crad	82,000	.....
Earnings	314,000	(233,000)

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Computerworld Stock Trading Summary

CLOSING PRICES WEONESOAY, AUGUST 4, 1976

All statistics compiled, computed and formatted by TRAOE★QUOTES, INC. Cambridge, Mass. 02139

COMRUTER SYSTEMS

EXCM		PRICE 1976 RANGE III	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGMS CORP	84-108	95 1/4	- 1/2	-0.5
O	COMRUTEB AUTOMATION	10- 19	16 T/8	+ 5/8	+3.8
N	CONTROL OATA CORP	18- 27	24 1/8	+1	+4.3
M	OATA GENERAL CORP	40- 60	51	- 1/4	-0.4
O	OATAPOIMT CORP	24- 46	39 1/4	+1 1/4	+3.2
O	OIGITAL COMP COMTROL	2- 7	5 5/8	- 3/8	-6.2
N	OIGITAL EOUIPMEMT	138-181	170 1/8	+ 1/8	0.0
N	ELECTROMIC ASSOC.	2- 5	3	+ 1/8	+4.3
A	ELECTRONIC EMGIMEEB.	T- 16	10	+ 1/4	+2.5
M	FOXRORO	28- 47	46 7/8	+3 1/8	+7.1
O	GENEBAL AUTCMATIOM	5- 11	7 1/2	+1 1/8	+17.6
O	GRI COMRUTER CORP	1- 1	5/8	0	0.0
N	HEMLE7T-PACRABC CO	95-11T	106 3/4	-2 1/4	-2.0
M	HONEYMELL INC	34- 56	48	+ 5/8	+1.3
M	IBM	227-280	276 3/4	+3 3/4	+1.3
O	MAMAGEMENT ASSIST	1- 3	2 1/4	+ 1/8	+5.7
O	MEMOREX	18- 33	26 7/8	+ 3/8	+1.4
O	MICRODATA CORP	10- 2T	26	+2	+8.3
O	MODULAR COMPUTER SYS	5- 14	5 1/2	-5 3/4	-51.1
N	MCR	24- 36	34 1/8	+1	+3.0
O	PRIME COMPUTER IMC	4- 14	13 1/4	- 3/4	-5.3
M	PERKIN-ELMER	19- 2T	20 3/4	-1 3/8	-6.2
N	RAYTMECM CO	45- 66	63	+2 1/2	+4.1
N	SPERRY RAMO	40- 52	46 7/8	+ 1/8	+0.2
O	SYCOR IMC	20- 31	21 1/2	-1 1/2	-6.3
A	SYSTEMS ENG. LABS	6- 10	8 3/8	- 1/8	-1.4
N	YARIAM ASSOCIATES	13- 17	14 1/2	0	0.0
A	WANG LABS.	11- 20	15 1/2	0	0.0

LEASING COMPANIES

EXCM		PRICE 1976 RANGE III	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	CCMOISCO INC	3- 10	7 1/2	+ 1/4	+3.4
A	COMMERCE GROUP CORP	2- 3	2 3/4	- 1/8	-4.3
A	COMPUTER IMVSTRS GRP	1- 3	2	+ 1/4	+14.2
M	OATRCMIC REMTAL .	1- 1	1 1/8	0	0.0
A	OCL INC	1- 1	5/8	0	0.0
M	OPF IMC	5- 8	7 1/4	+ 1/8	+1.7
A	GREYMOUNO COMPUTER	3- 8	7 1/8	- 1/8	-1.7
N	ITEL	6- 15	13 3/8	- 1/4	-1.8
N	LEASCO CORP	6- 19	17 1/4	+1 3/4	+11.2
O	LEASPAC CORR	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	- 1/8	-25.0
A	RICNEER 7EX CURP	6- 9	7 1/4	- 1/8	-1.6
M	U.S. LEASING	7- 12	10 1/2	+ 1/4	+2.4

EXCM: N=NEW YORK; A=AMERICAN; P=PHIL-BAL7-WASH
L=NATIONAL; M=MIOWEST; O=OVER-7HE-COUNTER
O-T-C PRICES ARE BIO PRICES A3 OF 3 P.M. OR LAST BIO
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SOFTWARE & EOP SERVICES

ERCH		PRICE 1976 RANGE III	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOVANCEO COMR TECM	1- 2	1 3/R	0	0.0
O	AMACOMR INC	8- 11	8 1/2	+ 1/8	+1.4
A	APRLIEO OATA RES.	2- 4	3 5/8	- 1/8	-3.3
N	AUTOMA7IC OATA PROC	17- 35	34	+1	+3.0
O	COLEMAM AMERICAM COS	3- 6	3	0	0.0
O	COMPUTER OIMEMSIOMS	3- 7	5 1/2	+ 1/4	+4.7
O	COMP ELECTIOM SYSTMS	5- 9	6	- 1/2	-7.6
O	COMPUTER MORIZONS	1- 2	2	0	0.0
O	COMPUTER METMORK	2- 6	3 1/2	+ 1/4	+7.6
N	COMPUTER SCIENCES	4- 8	6 5/8	0	0.0
O	COMPUTER TASR GROUP	1- 1	1 1/4	- 3/8	-23.0
O	COMRUTER USAGE	3- 6	2 3/4	- 1/8	-4.3
O	COMSHARE	2- 9	6 3/4	- 3/4	-10.0
O	CATA OIMEMSIONS INC	2- 4	3	0	0.0
O	OATATAB	1- 1	1	+ 1/8	+14.2
N	ELECTRONIC CATA SYS.	12- 16	14 3/4	+1 5/8	+12.3
O	INFONATIOMAL IMC	1- 1	1/8	0	0.0
O	IMSYTE CORP	1- 3	1 3/4	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	- 1/4	-18.1
O	KEAME ASSOCIATES	2- 4	3 3/8	0	0.0
O	REYOATA CORP	2- 5	2 3/8	- 1/8	-5.0
O	LOGICON	4- 4	3 5/8	+ 1/8	+3.5
A	MANAGEMENT OAIA	1- 3	2 1/4	0	0.0
A	MATIONAL CSS IMC	13- 25	21 5/8	- 1/8	-0.5
A	ON LIME SYSTEMS INC	18- 22	19	+ 3/8	+2.0
N	PLAMNING RESEARCM	3- 5	3 1/2	- 1/4	-6.6
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RARIOATA INC	2- 5	2 1/8	+ 1/8	+6.2
O	REYNOLOS & REYNOLO	13- 21	18 1/4	+ 1/2	+2.8
O	SCIEMTIFIC COMRUTERS	1- 1	1/2	0	0.0
O	TYMSHARE INC	19- 28	26	+ 5/8	+2.4
A	URS SYSTEMS	3- 5	3 3/4	- 1/4	-6.2
N	WYLY CORP	2- 7	2 5/8	- 1/8	-4.3

PERIPHERALS & SUBSYSTEMS

ERCH		PRICE 1976 RANGE III	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
M	AOORESSOGRAPM-MULT	8- 13	10	+ 1/4	+2.5
O	AOYANCEO MEMORY SYS	4- 10	7 1/2	- 3/8	-4.7
M	AMPEX CORP	3- 10	8 3/8	0	0.0
O	ANOERSON JACOBSON	2- 4	2 5/R	- 1/8	-4.5
O	APPLIEO OIG OATA SYS	13- 25	22	- 1/4	-1.1
O	BEEMIYE MEOICAL ELEC	3- 9	8	- 1/8	-1.5
A	BOLT.BERANER & MEW	7- 11	9 3/8	- 1/8	-1.3
N	RUNKER-RAMO	5- 10	8 T/8	0	0.0
A	CALCCMP	4- T	5 1/2	+ 1/R	+2.3
O	CAMBRIOGE MENORIES	0- 6	7/8	+ 1/2	+133.3
M	CEMTROMICS OA7A COMP	20- 36	33 3/8	+2	+6.3
O	CODEX CORP	22- 42	32 1/2	+ 1/2	+1.3
O	COGMITRONICS	1- 1	7/8	0	0.0
O	CCMPUTER COMMUN.	1- 5	5 5/8	+1 1/8	+25.0
O	COMPUTER CCNSOLES	4- 7	5 1/2	- 1/4	-4.3
A	COPPUTER EOUIPMENT	1- 3	1 7/8	+ 1/4	+15.3
O	COMPUTER TRAMSCEIVER	1- 3	7/8	- 1/8	-12.5
O	COMTEM	4- 9	8	0	0.0
N	CONRAC CORP	20- 25	22 7/8	- 7/8	-3.6
O	OA7A ACCESS SYSTEMS	1- 4	3 1/4	0	0.0
O	OATA 100	7- 13	8 5/8	+ 1/2	+6.1
A	OATA PROOUCTS CORP	5- 15	14	+1	+7.6
O	OATA 7ECMNOLOGY	1- 2	1 3/8	- 1/8	-8.3
O	OATUM IMC	1- 2	1 1/2	- 1/4	-14.2
O	OECISIOM OATA COMPUT	1- 4	1 3/4	- 1/4	-12.5
O	OELTA OATA SYSTEMS	1- 1	1	0	0.0
M	ELECTRONIC M & M	1- 3	3	0	0.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
M	MAZELTIME CORP	4- 12	9 3/8	- 1/8	-1.3
M	HARRIS CORR	34- 54	53 1/2	+2 1/2	+4.9
A	INCOTEBM CORP	9- 20	10 1/4	+ 1/8	+1.2
O	INFOREX IMC	3- 7	3 3/4	- 1/8	-3.2
O	INFORMATIOM IMTL IMC	10- 18	11 1/2	+ 1/8	+1.0
O	INTEL CORP	60-109	64	+1	+1.5
A	LUNDY ELECTRONICS	4- 7	4 1/8	- 1/4	-5.7
O	MSI OATA CORP	3- T	6 5/8	- 1/4	-3.6
A	MILGO ELECTRONICS	15- 21	19 3/8	+ 7/8	+4.7
M	MOMAWK OATA SCI	3- 9	8 7/8	+1	+12.6
O	RENRIL CORR	1- 3	1 7/8	0	0.0
A	PERTEC CORR	3- 8	3 1/2	- 1/4	-4.3
A	POTTER INSTRUMEMT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	OUANTOR CORP	4- 6	5	0	0.0
O	RECOGMITION EQUIP	6- 11	8 1/4	- 3/8	-4.3
M	SAMOERS ASSOCIATES	6- 11	9 1/2	- 1/8	-1.2
O	SCAM DATA	2- 4	2 1/4	0	0.0
O	STORAGE TECMNOLOGY	9- 13	12 1/2	+ 5/8	+3.2
O	T BAR INC	5- 10	6	+ 1/4	+4.3
O	TALLY CORP.	4- 6	4 3/4	0	0.0
O	TEC IMC	3- 5	3 3/4	0	0.0
N	TERTRONIR IMC	45- 6T	63	-1 1/4	-1.8
M	TELEX	2- 5	3 1/4	- 3/8	-10.3
O	WAMGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 3/4	- 1/8	-4.3

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE III	CLOSE AUG 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOVANCEO SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 3	3 1/4	- 1/4	-7.1
A	BARRY WRIGHT	6- 10	T 7/8	- 1/8	-1.5
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	OATA OOCUMENTS	30- 42	29 3/4	- 1/4	-0.8
O	OUPLEX PROOUC7S INC	14- 24	14 3/8	- 3/8	-4.1
N	EMMI3 BUS. FORM3	6- 8	6 5/8	+ 1/4	+3.9
O	GRAMAM MAGNETICS	8- 13	10	+1	+11.1
O	GRAPMIC CON7ROLS	13- 19	13 1/2	+1	+8.8
N	3M COMPANY	53- 65	60	+ 1/8	+0.2
O	MOORE CORP LTO	40- 51	42	+1 1/2	+3.7
N	NASMUA CORP	11- 17	17 3/8	+1 1/8	+6.9
O	STAMOARO REGISTER	15- 19	15 3/4	+ 1/4	+1.6
O	TAG PRODUCTS CO	3- 11	9 1/2	- 1/2	-5.0
N	UARCO	21- 25	21 1/2	0	0.0
A	WABA3M MAGNETICS	4- 8	7 3/8	- 1/8	-1.6
N	WALLACE BUS PORMS	19- 23	20	- 1/4	-1.2

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City	Dates
San Francisco	March 29-April 1
Los Angeles	April 5-7
Cleveland	April 19-21
Minneapolis/St. Paul	April 26-27
Chicago	May 3-5
New York	May 10-12
Philadelphia	May 24-26
Washington, D.C.	May 31-June 2
Boston	June 7-9

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There are several ways for you to participate in the 1977 Caravan, and you can choose the one most suited to your company's marketing needs. Most Caravan exhibitors get complete, national coverage with our full-tour, standard booth and complete package of support services. OEM exhibitors—or those who wish to cover major cities only—can exhibit in our Major City/OEM tours with a standard booth and complete support package. The five cities in the Major City/OEM tours are San Francisco, Los Angeles, Chicago, New York and Boston.

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices

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ear August 16, 1976 Vol. X, No. 33

NEWSPAPER

Aerial Photos of New England

A computer helped the Army Corps of Engineers control flooding when Hurricane Belle hit New England last week by analyzing when the gates at dams like this one at Vermont's Ball Mountain should be closed down.

Belle Tests Network's Ability To Reduce Destruction by Flood

By Nancy French

Of the CW Staff

WALTHAM, Mass. – After spending most of its fury on Long Island's southern coast, Hurricane Belle swept through New England as a "mere tropical storm" last week.

Belle dumped up to six inches of rain in Vermont in about 12 hours, causing major flooding and damage to crops in the western part of the state.

But to the east along the Connecticut River basin, which stretches from Canada to the Connecticut coast, property and crops were saved from disaster by a system of flood-control dams built and controlled by the Army Corps of Engineers and an IBM 1130 computer.

Data fed to the computer from 41 remote reporting stations along the region's major river basins as well as Block Island and Old Saybrook, Conn., on Long Island Sound fed hydrological engineers here a steady stream of environmental data on the growing storm, according to Saul Cooper, chief of the corps' Water Control Branch here.

Information on river, tide or reservoir levels, precipitation, barometric pressure, wind speed and wind direction helped them decide when and how much to close the region's 35 river dams and the four

(Continued on Page 4)

Terminal Aiding in Search For 'Legion Disease' Cause

By Catherine Arnst

Of the CW Staff

A portable computer and an automated influenza surveillance system are aiding the search for the cause of the mysterious "Legionnaires' disease" which killed 27 people and hospitalized 125 others by the end of last week.

The disease appeared during an American Legion convention held in Philadelphia July 21-24 and attended by approximately 10,000 people.

Some 150 epidemiologists from both the National Center for Disease Control (NCDC) in Atlanta and the Philadelphia Department of Health are now trying to discover what caused the illnesses by questioning everyone who attended the convention – both those who fell sick and those who showed no signs of illness.

The replies to the list of 23 questions asked are being keyed into an IBM 5100 portable computer used as a terminal in Harrisburg, Pa.

This terminal transmits data by acoustic coupler over phone lines to the NCDC's IBM 370/158, which then transmits the data to a Digital Equipment Corp. PDP-11/40. Data is being analyzed on the terminal in Harrisburg; until last week this was done on the PDP-11/40.

In Atlanta, the National Influenza System, a year-old automated system used to keep track of outbreaks of influenza in the nation, was used to analyze the data. Influenza has almost entirely been ruled out as a cause of the disease, however, so the NCDC is now only compiling the data; most of the analysis is being done with the terminal in Harrisburg.

The investigators are hoping the system will produce an indication of some pattern common to all those who fell ill. Data has already been collected on those who are ill; now convention attendees who were not stricken are being interviewed.

"What we're trying to find out is what made them different. We're zooming in now on the people who didn't get sick to find that out," a public health advisor at NCDC said.

The system has been used nonstop since the beginning of August, but no patterns have emerged. Data is still being collected, however, and it's early for any similarities in cases to show up, the health advisor added.

Information on this disease is being gathered and analyzed much quicker than in past situations because of the computer hookup, according to Rick Curtis, chief of the Information Services Group of the Surveillance and Assessment Division of NCDC.

This is the first time the NCDC has placed a terminal in the field, he said, and the amount of time saved as a result "is tremendous."

Previously, disease investigators would transmit information over the phone; the terminal, however, allows for rapid data analysis both on-site and in Atlanta, Curtis said.

World Seen Approaching 'Data Spasm'

By Ronald A. Frank

Of the CW Staff

TORONTO – The world is rapidly approaching a "data spasm" of transnational data flow that operates under no restraint or accountability, according to Joseph Overton, legislative assistant to Rep. Barry Goldwater Jr. (R-Calif.).

Speaking at the recent International Conference on Computer Communication here, Overton warned a session on privacy and security issues about data flowing across international boundaries.

Such data can "frustrate and crush" the various national efforts to balance individual rights and the need to know with the protection of individual, personal and human integrity, he said.

The individual or organization can become an "informational pirate" that takes advantage of the "international legal vacuum" to pillage "informational valuables" belonging to businesses and individuals, he said.

These data pirates will be able to retreat to a safe "data haven" to utilize the information for their own gain, Overton predicted. "None of us can protect against the pirate and the potential data haven he can retreat to."

Telecommunications is as vulnerable to interception and theft as were ocean-going vessels, and international treaties and agreements on copyrights and patents are not sufficient to provide essential protections, he said.

U.S. courts still have no clear-cut legal concept of informational privacy; they have no consistent precepts of the relationship between the need to know and the right to be left alone. But many nations have gentlemen's agreements and understandings that these situations can be worked out on a case-by-case basis, Overton said.

Much of what the various nations have created to date in the area of information management can be "marred" by bilateral or multilateral agreements. "We are all ignoring the individual or nation that, for other than political, ideological or sovereign reasons, may pirate information. In America, Watergate, organized crime and international corporate bribery have given us a glimpse of what the potential is," he

(Continued on Page 2)

System Monitoring Whereabouts Of Delegates at GOP Convention

By Catherine Arnst

Of the CW Staff

KANSAS CITY, Mo. – Gerald Ford and Ronald Reagan are not the only ones keeping track of the delegates at the Republican National Convention here this week.

The Convention Committee is also accounting for the whereabouts of every delegate, journalist and anyone with official status by using a reservation tracking system implemented on the IBM 370/158 that handles this city's data processing.

The system is keeping track of 15,000 people, the hotels where they are registered and the group or state with which they are affiliated. It was developed by the city as part of $500,000 worth of services the city offered the committee in return for holding the convention here.

The Convention Housing Committee asked Kansas City in February to develop a computerized reservation system to handle the 110 hotels and motels being used for the convention, according to Kenneth Ruhnke, manager of computer facilities for the city.

Surprised at Success

The system was developed in-house from scratch, Ruhnke said, adding that the system is working excellently, "quite to our surprise. We didn't have any experience with this sort of thing; our experi-

(Continued on Page 2)

EFT to Save Banks Annual $700 Million By 1983: ABA Officer

MIAMI – An estimated 5.2 billion future retail transactions using electronic funds transfer (EFT) systems could save banks $700 million annually, according to Willis W. Alexander, executive vice-president of the American Bankers Association (ABA).

"An ever-increasing number of consumers are using EFT terminals that permit funds to be debited and credited to bank accounts via an electronic communications network, thus eliminating the need for the exchange of cash or checks," he said at the First Interamerican Bankers Conference here recently.

"Of the 80 billion retail transactions predicted for the nation in 1983, some

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OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PL. Phone (01) 485-2248/9. Telex 264737. **W. Germany:** Computerworld c/o Computerwoche GmbH, 8000 München 40, Tristanstrasse 11. Phone 36-40-36/37. Telex 5215350. **Asia:** Computerworld c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda, 1-chome, Shinagawa-ku, Tokyo 141. Phone (03) 445-6101. Telex 26792.

Second-class postage paid at Boston, Mass. and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700.

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POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160.

Tied to CPU in New York

Minis Set to Relay Delegates' Choices

KANSAS CITY, Mo. – As soon as each state delegation at the Republican National Convention here this week casts its votes to nominate a Presidential candidate, television news correspondents will report the tally using two minicomputers.

The Digital Equipment Corp. PDP-11/04s will provide the voting information to the three television networks covering the convention. The "pool" information supplied to the networks will come from a special election display system developed hy AGS Computers, Inc. of New York.

The DEC minis, tied by a leased telephone line to an IBM 370/155 at CBS-TV in New York City, will be used to receive and display the cumulative votes.

As each delegation is polled, votes will be input via a CRT terminal here. The data will be forwarded over the communications link to New York for massaging and additional analysis if necessary, according to Joe Cunningham of AGS Computers.

Additional data about the candidates and members of each delegation as well as the results will then he returned to the convention site in a format designed for easy broadcasting, he explained.

The minis also will be used to drive a Vidifont – a device that converts digital data into numerical pictures that may be used directly on a television screen. These pictures will be sent to the local control rooms of each network for use at their convenience.

A similar system was used at the Democratic Convention in New York [CW, July 19].

System Monitors GOP Delegates

(Continued from Page 1)

ence is with more typical governmental applications."

Written in Cobol and run in IBM's Customer Information Control System (CICS) environment, the system cost $6,000 to $7,000 to develop, Ruhnke said.

The data for the system was obtained from preprinted forms sent out by the Convention Committee to each state delegation and other groups that planned to he at the convention. The forms included the hotel, group name and a registration number, and were then filled out with the convention attendees' names and their room requirements.

The information was then keypunched in hy the city's DP department. When all the data had been entered in late May, the system was ready to print out lists by last name, hotel, state delegation, group affiliation and registration number.

At the convention housing office, set up at the Radisson Muehlebach Hotel, the staff is using an IBM 3275 terminal and IBM 3284 printer lent to it by the city to update the data when changes are made and to obtain information on the whereabouts of any attendee. The system is also capahle of receiving and forwarding a 20-word message for an attendee.

The only support the city is giving the system at this point is updating the printout every few days, Ruhnke said. DP chores for the city have not backed up because "we had a long leadtime for developing the system," he added.

Ruhnke believes this is the first successful system of its type to he developed by a city. A similar attempt was made in 1972 by San Diego, which was originally slated to be the site of that year's Republican convention. The convention was moved to Miami, however, and that city ahandoned the idea after they found it to be a "Herculean task," he said.

Kansas City has no plans for the system once the convention is over, but Ruhnke theorized that "the convention people might like to have it."

The Convention Housing Committee would probably agree. "It serves our purpose perfectly," according to Maxine Cooper, assistant to the chairman of the committee.

World Seen Near 'Data Spasm'

(Continued from Page 1)

said.

Telecommunications satellites and microwave communications can be intercepted, signals separated and deciphered. The increasing availahility of communications equipment has brought "each of us to the brink of individual international communication capability. All that is so far thankfully missing . . . is a deliberate, organized effort to do it as a business."

The incentives for data piracy are great, and information that previously had only national significance now has international value. And such information can he acquired and utilized almost instantly, Overton said.

Nations and concerned individuals will have to consider how to cope with the data haven potential. "I consider it a probability that data havens will develop; the world has renegades and pirates in every human activity. To fail to come to grips with this prohlem may well mean informational technology will overcome its own master."

He called on nations to make compatible freedom of information and personal privacy, to humanize information practice and to intelligently marry various national efforts with those of other nations.

Among the nations currently engaged in legislative efforts concerning the control of data flow, Overton listed the U.S., Canada, Germany, Sweden, Norway, Austria, England, The Netherlands, France, Japan, Australia and others "demonstrating more than a passing interest in such national legislation."

Viking Project Spared DP Problems So Far

PASADENA, Calif. – Although scientists at the National Aeronautics and Space Administration's Jet Propulsion Laboratory (JPL) here have experienced difficulties with the telescoping arm of Viking I's soil sampler, no computer problems have developed.

According to a source at JPL, there have not been any problems with the two miniature computers on board the craft visiting the Martian surface [CW, July 12].

In addition to the equipment 215 million miles from home, "no unusual prohlems with the [computer system] ground equipment here have developed" and no mishaps in transmitting the Viking data have occurred, the JPL spokesman said.

There is the possibility, however, that some snags may develop when Viking I's sister ship, Viking II, goes into orbit this week. The second spacecraft may cause a load on the JPL computer systems "hecause three sources of data will he transmitting at the same time," he explained.

Should computer difficulties develop on the planet, it may be difficult – at the very least – to find on-site service representatives to restore the systems.

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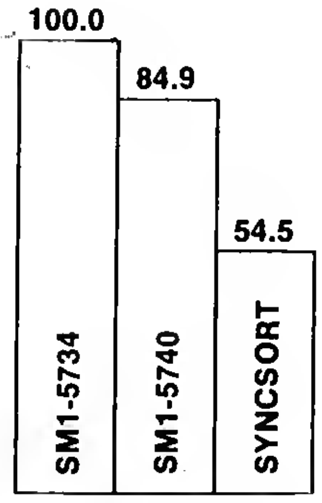
Next, just to make certain that everything was really on the up and up, IBM dispatched one of their technical people to serve as their representative.

Then IBM did the finest thing of all. They sent their own "stopwatch." This was an MF-1 monitor, designed especially to evaluate systems performance on MVS. It was, they told us, accurate as a pawnbroker's eye. That was fine with us. We're scientists, too.

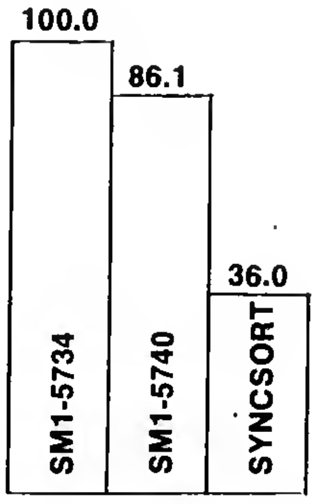
Finally, the moment of truth came. The tests were run . . . the observers gathered round to examine the still smoking results . . . and guess what?

SyncSort III-and-half won everything! IBM's MVS/MF-1 said so. And who are we to argue?

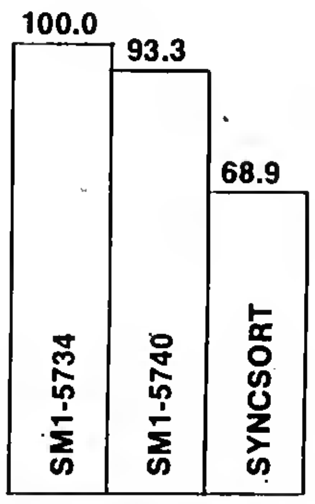
The results are pictured below. Please remember that in a "sorting olympics" the winner always stands on the lowest platform. And that's where SyncSort stood all day while the Whitlow anthem was played again and again.



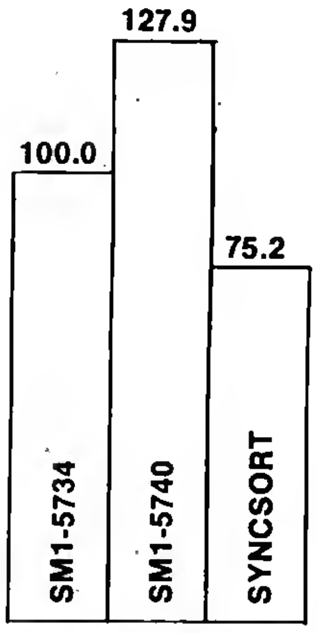
ELAPSED TIME



DISK KILOBYTE MINUTES



CHANNEL TIME (FROM MF-1)



TOTAL CPU TIME (TCB & SRB FROM MF-1)

OVERSEAS REPRESENTATIVES —

London, Paris, Dusseldorf, Brussels — (Gemini Computer Systems), Rijswijk (ZH) — (PANDATA), Madrid — (Entel/Ibermatica), Vienna — (Ratio), Sao Paulo — (Deltacom Do Brasil), Melbourne — (The Shell Company of Australia, Limited),

Should IBM be discouraged? Not in the least. The difficulty is that the computer giant is competing in the wrong events. Maybe he ought to stick to events where weight and muscle are prime requisites for success. The hardware throw, for example.

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Senate Approves Tax Reform Bill With SSN Clause

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Senate has approved the Tax Reform Act of 1976 – and with it a provision allowing any state motor vehicle department, taxing authority or public assistance agency to demand an individual's Social Security number (SSN) in the course of administering its programs.

The Senate approved the measure by a vote of 49-42 despite a floor battle fought by senators Charles Percy (R-Ill.) and Barry Goldwater (R-Ariz.).

Differences between the House and Senate versions of the bill will be resolved by a conference committee composed of members of both houses sometime after this week's Republican National Convention.

If the amendment is approved by the conference committee and the bill is passed into law by a vote of both houses, it will wipe out the limitations on the use of the SSN contained in the Privacy Act of 1974 [CW, Aug. 2].

The Senate's approval of the bill marked a victory for Sen. Russell B. Long (D-La.), who told his colleagues that SSNs are needed to prevent "welfare cheating, welfare chiseling, keeping runaway fathers from forever escaping their duty to help support their children and in checking on whether people are entitled to benefits that are available under welfare programs."

Percy, however, argued that existing federal law permits the Parent Locator Service to obtain a missing parent's name, SSN and last known address from the Internal Revenue Service, the Social Security Administration and any state or local government agency believed to have such information.

While Long agreed, he contended "that is not going to do any good unless you can find the number somewhere." If no government agencies are permitted to use it, "where do you have a prospect of finding it?" he asked.

Goldwater argued that full-scale hearings should be held before making changes in existing law concerning use of the SSN.

He argued further that citizens should not have to relinquish their privacy for the sake of a few who evade their responsibilities.

"Right smack dab in the middle of a 1,500-page bill we call a tax bill, we get worried about finding wayward fathers" who total 1.2% to 1.6% of the population with Social Security cards, Goldwater said. "We are sort of killing mice while the elephants are running around stamping things out," he added.

Percy succeeded in getting approval to limit the uses to which the authorized agencies may put the SSN. These include identifying individuals for purposes of the Parent Locator Program and administering their own programs. The authorized agencies would be prevented, for example, from selling lists of names of automobile registrants identified by SSN.

To give the amendment some teeth, the Senate approved language making an individual who illegally uses, discloses or compels disclosure of the SSN guilty of a misdemeanor.

Belle Brings Display of Network to Reduce Floods

(Continued from Page 1)

hurricane barriers that protect the region's exposed south shore harbors.

Last Monday, after a weekend of rain, area streams and rivers were swollen by runoff, but there wasn't much that could be done about it besides warning campers to leave the area and interrogating reporting stations more frequently, Cooper said.

At 8 a.m. that day, dam personnel began calling in alert reports. This is standard procedure as soon as reservoir levels begin to rise or one inch of rain is recorded, he said.

Hydraulic engineers maintained their watch all day Monday and, as the storm approached and rainfall grew heavier in isolated locations, rivers started to fill and dams were slowly shut down.

The hurricane barrier protecting New Bedford, Mass., was closed about 6:30 p.m. and the barrier at Stamford, Conn. was closed three hours later.

Ball Mountain Dam, a 265-foot high barrier on the West River near Jamaica, Vt., which is normally kept at 62.2 feet for recreational purposes, was beginning to fill. This dam protects the cities of Holyoke, Northampton, Springfield and Chicopee, all in Massachusetts, as well as Hartford, Conn.

Two of the dam's three 3-feet by 10-feet wide gates were closed and the third was open three feet.

The computer, which automatically converts water level to water flow, a more telling measurement, indicated 700 cubic feet of water were coursing through the dam every second, according to Bob Mirick, hydraulic engineer.

The 3 a.m. reports on Tuesday showed a little change, and by 6 a.m. water had risen only three more feet, Mirick added.

But two hours later, two more inches of rain had fallen and the water level had risen 13 more feet.

Based on this real-time data as well as analysis of past floods, including travel times of streams into the main river, volume of water and peak rainfall, which the computer converts to runoff, it was decided at 8 a.m. to shut down the remaining gate to one-tenth of one foot, Mirick said.

Reports from other dams along the Connecticut River basin were similar.

While personnel here in Waltham worked around the clock to dam the raging rivers and their tributaries, "throttling down" 12 of the region's 35 dams completely, little rain was falling on the Merrimac River basin less than 100 miles to the east, Cooper said.

Conditions along Vermont's Black River weren't so rosy. There, where no dams have ever been built, flooding was serious. At press time Vermont officials who were assessing damages said they are likely to ask that parts of the state be declared disaster areas so individuals and businesses would be eligible for federal aid.

But flood waters often recede as quickly as they rise, and by 8 a.m. Wednesday the dams were being systematically opened once again.

No Guesswork

Without the transmission network and its automated reporting station, flood control would be a by-guess and by-gosh situation, Cooper indicated.

Each mechanical reporting station contributes to a detailed comprehensive hydrological picture. It reads the environmental variables, converts the data to binary coded decimal signals and feeds that information into the computer, where it is recorded on disk and then retransmitted in teletypewriter code back through the same channels to one of several dams where it can be used for dam operation.

Software, written mostly in Fortran and Assembler language, automatically schedules interrogation in sequence and converts data to engineering information.

Messages printed automatically by an IBM 1132 are flagged with alert signs to warn personnel in advance about possibly hazardous conditions, he said.

Because of the large geographical area from which the environmental data is collected, the central station here does not communicate directly with the remote data stations, Cooper said. Instead, messages are sent via a multichannel microwave radio repeater system and VHF radio intermediate repeater stations.

Satellite May Someday Replace Army's Flood Control System

WALTHAM, Mass. – The radio-based data collection system used by the Army Corps of Engineers in making flood control decisions may someday be replaced by a satellite.

Under a contract with the National Aeronautics and Space Administration, the Corps is testing the feasibility of using the Earth Resources Technology Satellite (Erts) for gathering environmental data from 30 data collection platforms installed throughout New England.

Since 1972 Erts has been relaying river level, precipitation and water quality data from the remote platforms to the Corps' Waltham headquarters in real time. There it is processed by a Data General Corp. Nova 1200 minicomputer.

The satellite, which circles the earth approximately 14 times a day, makes about five "useful passes" – orbits that are high enough to transmit information successfully – Tim Buckelew, a hydraulic engineer said.

The Nova calculates the path of each orbit and feeds that data to a microwave tracking antenna which angles itself for the most accurate tracking.

The satellite picks up signals as it passes over the platforms and transmits them to the receiving antenna here. These signals are fed into a decoder and then to the minicomputer which performs the necessary calculations.

The calculations are then displayed on a Tektronix, Inc. 4014 CRT and stored on disk.

The 30 remote stations identify and transmit a 38-msec message every three minutes to ensure the data is picked up as the satellite passes over the region, he said.

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'Victim' Presses Privacy Laws for Credit Reporters

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – An Atlanta businessman who proved Dun & Bradstreet (D&B) disseminated false information about his companies and won $2.2 million in damages as a result urged that privacy laws be extended to business credit reporting agencies.

Mike Goldgar, who once headed Dejay Stores, a now bankrupt retail clothing chain, and United Star Companies, Inc., an Atlanta-based conglomerate that is also defunct, said businesses should have the same rights as individuals to see and correct their credit files.

Goldgar was one of several "victims" who testified here recently before the Privacy Protection Study Commission on the subject of consumer and business credit reporting practices.

After three days of testimony, two viewpoints emerged: consumer and credit reporting agencies opposed tougher privacy laws while individual victims like Goldgar, James C. Millstone (see accompanying story) and a spokesman for the American Civil Liberties Union supported legislation limiting reports to "relevant" matters and allowing individuals to see reports that will be disseminated about them.

Relevance proved to be an elusive concept, however, with both sides arguing that seemingly irrelevant life-style questions could in fact be relevant.

Goldgar's difficulties apparently began when D&B gave his companies an unfavorable credit rating. He protested, taking his dispute as high as D&B's president.

When Goldgar refused to identify sources of loans, however, D&B employees refused to correct his record. In fact, they set out "to get me" and spread rumors about his finances, Goldgar told the committee.

D&B employees then persuaded three creditors to force Goldgar into bankruptcy, Goldgar said. One was owed $8,000, a second $4,000 and a third $57.

Internal memoranda supporting that conclusion were subsequently produced from D&B's files and introduced as evidence in his case against the firm.

As a result of D&B's action, Goldgar's credit was frozen and bankruptcy resulted.

D&B Data Limited

D&B officials testified that information on the principals of a firm contained in a D&B report is limited. A report contains no references to an individual's personal habits, life-style or personal financial dealings, according to Hamilton B. Mitchell, chairman of the executive committee of Dun and Bradstreet Companies, Inc.

Such information, he said, is limited to the executive's present position; previous business experience; bankruptcies and criminal convictions, if any; education background; year of birth; and marital status, Mitchell said.

Commission Chairman David Linowes disputed this claim, remarking that in his many years in the public accounting business he had seen many D&B reports that referred to the estimated value and condition of an individual's home and his neighborhood, for example.

Mitchell stated further that a major portion of a report is obtained from the business itself, and "any time a company wants to see what we are saying about it, we will give it a copy of its report."

Harold T. Redding, D&B senior vice-president, defended D&B's practice of retaining records of arrests that are not disposed of within six months whether or not an individual is ultimately proved guilty because such charges can have a serious inpact on a business.

Redding denied obtaining arrest information from any sources other than newspapers.

Relevancy of Data On Personal Habits Attacked at Hearings

WASHINGTON, D.C. – Are housekeeping standards, sexual preferences, personal grooming, drinking habits or political, social or religious associations "relevant" and legitimate subjects for consumer credit and insurance investigations and long-term storage in computer data banks?

Many witnesses who testified before the Privacy Protection Study Commission here recently think they are not.

One of them, Jeremiah S. Gutman, chairman of the American Civil Liberties Union's Privacy Committee, granted that if it can be proven statistically that homosexual adults, for example, reduce their life expectancy by patronizing gay bars and "cruising public restrooms," sexual preference could be considered relevant for preinsurance investigation.

He noted, however, that "straight" adults could endanger themselves similarly by cruising dating bars.

In discussing the concept of relevancy as it bears on due process of law, Gutman said information which may serve to demean or deprecate a witness, litigant or accused in the eyes of a judge or jury is excluded from a case unless it can be shown to be relevant to the issues to be decided.

"Thus a prior unsavory career, a lifestyle offensive to the majority, a previous incident similar to the accusation at issue are carefully kept from being contaminant of the impartiality of the finders of fact," he explained.

Much information collected by investigating and reporting agencies for credit grantors, insurance companies and employers is gathered and reported because of "irrational" but "traditional prejudices" of credit grantors, Gutman said.

Gutman urged that the issue of relevancy in credit and insurance reporting be approached by authorizing a specified list of acceptable areas for investigation, recordkeeping and reporting with sanctions against intrusions into areas not specifically permitted.

Since a piece of data becomes decreasingly relevant with the passage of time, Gutman suggested limitations be placed on the time during which arrest records, criminal charges or indictments not resulting in convictions are retained and used in business decisions.

Finally, to avoid imposing a heavy burden of compliance with a variety of federal and privacy state laws on organizations with national scope, Gutman recommended adoption of a single national statute.

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Consumer Finds FCRA Only Good For Those With Time and Money

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – A consumer with patience, money and above-average intelligence can use the remedies provided by the Fair Credit Reporting Act (FCRA) to assert his rights in a credit reporting dispute.

James C. Millstone, assistant manager of the *St. Louis Post Dispatch*, did it – and won $50,000. But it took four years and $4,000 in attorney's fees.

In December 1971, Millstone applied for auto insurance after moving from Washington, D.C., to St. Louis. At that time his insurance broker asked about "any skeletons in his closet," Millstone told Privacy Protection Study Commission hearings here recently on credit reporting practices.

Since he had never been arrested and had no auto accidents or traffic violations, Millstone told his broker there were none.

On Dec. 20, Millston's agent called him to tell him the insurance company had received a negative report on him from O'Hanlon Reports, Inc. Then he remembered problems with a neighbor when he was living in Washington.

Because he had a good relationship with his insurance agent, Millstone got his insurance anyway. It was only when he attempted to learn the contents of the report and find out who else had received it that he ran into trouble.

First, O'Hanlon said it needed the 10 days provided under the FCRA to respond to his disclosure request. Then, nine days later, O'Hanlon's local district manager read him a summary of the report from a single typewritten piece of paper, Millstone said.

This is as much as the FCRA requires. The report indicated four sources said Millstone was a drug user who had been evicted from three previous residences and had permitted peace demonstrators to sleep on his lawn. In addition his wife's name was recorded incorrectly in the report, he told the commission.

Millstone said he immediately filed a formal complaint with the Federal Trade Commission.

Two weeks later, Millstone received a second disclosure, also read from a single sheet of paper, but no file was provided. The new report indicated the original information had been provided by only one neighbor.

Drug use could not be verified and was therefore deleted, O'Hanlon said.

Millstone still received no assurance he had been told everything in the file nor was he confident others had not obtained it, he said.

Eleven days after the second disclosure, he received a registered letter from O'Hanlon's New York office indicating it had forgotten to tell him his neighbor had also reported that he transported peace demonstrators in his van and that his "undisciplined" children were destroying the neighbors' yards.

This information had been "overlooked" in O'Hanlon's effort to "expedite disclosure," Millstone said.

In April 1972, Millstone filed suit. He was awarded damages of $50,000 in January 1976.

When he finally obtained a copy of the report in the discovery phase of his lawsuit, Millstone learned the negative information had been derived from one nine-sentence paragraph, he said.

Howard A. Slayback, president of O'Hanlon Reports, told the commission such an incident could never occur again, his firm had apologized to Millstone and the case was closed.

EFT to Save $700 Million/Year

(Continued from Page 1)

5.2 billion will be automated," he said, noting that 90% of these will be initiated by either a credit or debit card.

"Cost savings in 1983, due to electronic innovations, are estimated at 14 cents per transaction – a total savings nationwide of $700 million annually," he said.

At the end of 1975, there were over 151,000 electronic point-of-sale (POS) cash registers linked to in-store computers. The total is expected to reach 590,000 by 1980, Alexander said, and many of these POS terminals will be linked to banks' computers in the future.

Consumers today may pay bills more conveniently from their own homes by telephone, have recurring bills deducted automatically from their bank accounts or have their paychecks or Social Security checks directly deposited in banks, he said.

"By 1980, 18 million people are expected to use this service, generating more than 216 million annual deposits electronically," Alexander said.

In 1955, only 100 banks offered credit card plans, Alexander said. Today that number has risen to over 14,000.

The dollar volume for the major bank credit card systems – BankAmericard and Master Charge – totaled $18.3 billion in 1975, more than doubling the 1970 figure of $6.8 million.

"The use of debit cards is another growth area in banking," he said. "These cards can electronically activate cash dispensers and automated tellers and give the customer access to his bank account – in many cases 24 hours a day, seven days a week."

Since 1968, when the first automated cash dispenser was introduced, more than 4,500 automated teller machines (ATMs) and cash dispensers have been installed by 1,300 financial institutions throughout the U.S., and another 4,300 are on order, he said.

"This year, 19% of the commercial banks in the U.S. will be using ATMs, and 93% of a representative sample of marketing executives predict their institutions will have ATMs by 1980," Alexander said.

Fraud Detection System To Save $2 Million/Year

BOSTON – Massachusetts welfare officials here estimated on the basis of initial results that $2 million could be saved annually with a computerized list-matching program to detect fraud.

The Department of Public Welfare (DPW) contracted with Urban Data Processing, Inc. (UDP) to match lists of recipients in one category of assistance with those in other categories four times annually [CW, May 3]. The first run in July turned up 5,632 matches out of the roughly 500,000 names used.

Of those 5,362, 5% will require investigation that may lead to either reduction or elimination of assistance, according to Steve Kane, acting assistant commissioner of DPW. The others are either legitimately receiving more than one type of aid or officials are already aware of the case.

The first run matched names on Aid to Familles with Dependent Children (AFDC) with those of the Department of Employment Security (DES), General Relief with DES, AFDC with General Relief and General Relief with Supplemental Security Income.

Matches are made on the basis of name and street address. The system is run on an IBM 370/158.

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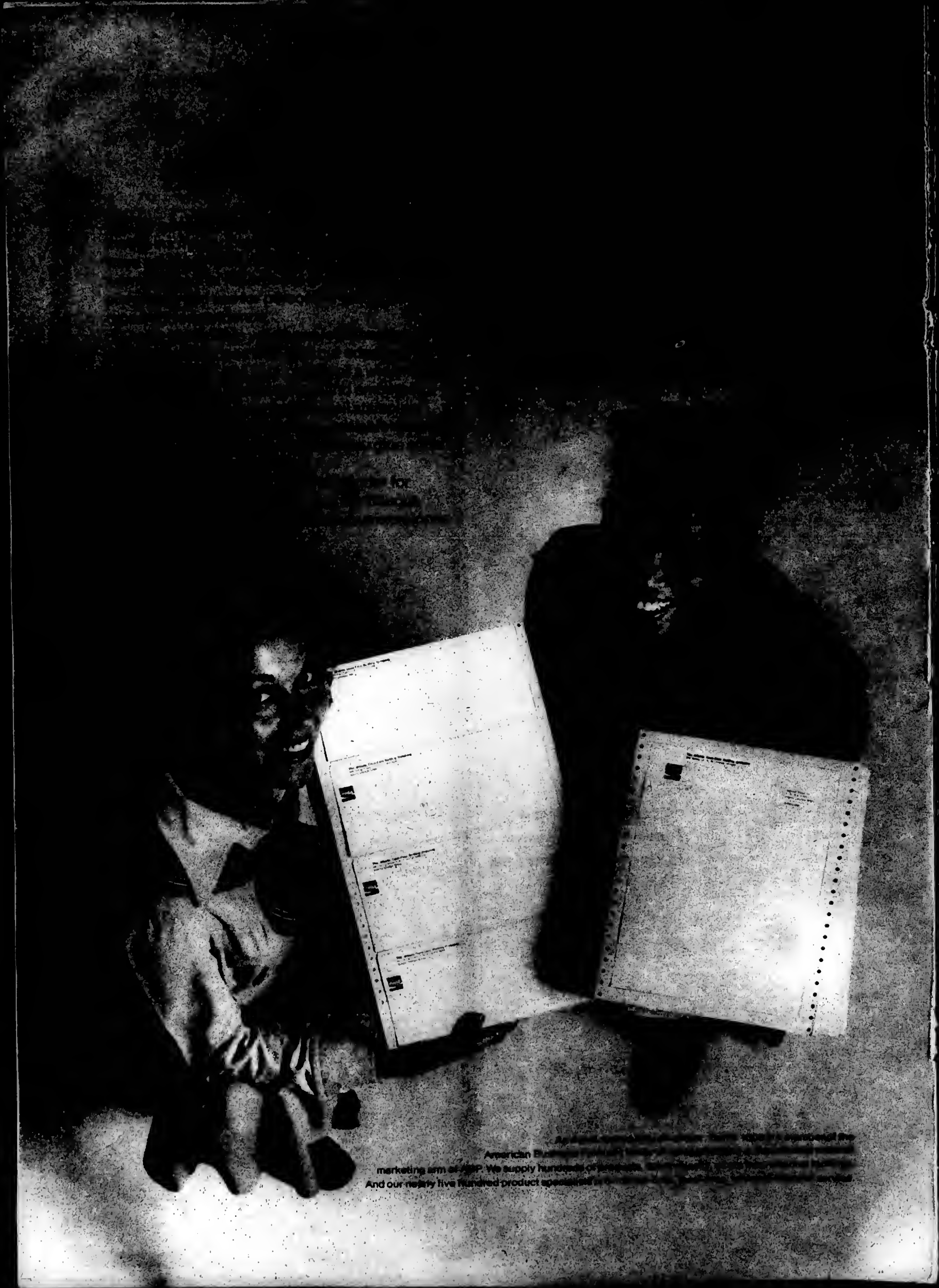

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Epidemiologist Fears Privacy Law Could Halt Research

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Extending the Privacy Act of 1974 into the private sector could seal all civilian health records and halt important research into the causes of disease, according to Dr. Donald S. Fredrickson, director of the National Institutes of Health.

Epidemiologists – doctors who trace the development of diseases by studying medical histories of individuals and specific populations over time – must have access to records of ill as well as "at-risk" populations to continue this vital work, Fredrickson said.

Other health specialists who testified before the Privacy Protection Study Commission here recently emphasized the need for confidentiality of records and supported the rights of patients to control access to medical files.

This is particularly important where health problems bear a stigma, commission members were told. Knowledge of the mere existence of a record detailing treatment for mental health, child abuse tendencies or alcohol or drug abuse could be extremely damaging, according to Dr. Neil Waldrop, deputy administrator of the Alcohol, Drug Abuse and Mental Health Administration.

'Strike a Balance'

"We must strike a balance between personal privacy and the good of society in making personally identifiable medical records available for important research," Fredrickson said.

Dr. E. Cuyler Hammond, vice-president of epidemiology and statistics for the American Cancer Society, emphasized the importance of medical records in cancer research.

Before two major studies were conducted that confirmed the relationship between inhalation of asbestos and mesothelioma, a form of cancer, it was believed asbestos inhalation resulted in cancer of the pancreas – a disease with similar symptons.

Only after researchers studied medical records and tissue specimens from thousands of employees who worked in an asbestos factory during World War II as well as records and tissue specimens of people who lived near the factory at that time was this misunderstanding cleared up, he said.

If a privacy law had required researchers to obtain consent from individuals or their next of kin before records could be obtained, these findings may never have been made, he said.

Veterans records are especially important in research performed by independent epidemiologists because they are relatively uniform compared with data maintained by private doctors, according to Dr. Lawrence B. Hobson, deputy assistant chief of the Veterans Administration's (VA) Medical Division for Research and Development.

The VA's register of 14,000 pairs of twins is very much in demand among medical researchers, he noted.

The Privacy Act, with its consent requirement, will have an important negative affect on epidemiological study now being done with these records in multiple sclerosis, slipped disk and exposure to microwave radiation, he said.

Fredrickson described why medical records are ill-suited to the provisions normally written into privacy laws.

Requiring that all information be collected from a patient is not a particularly good idea since patients often do not given accurate data on themselves; information about life-style and habits provided by friends and relatives is frequently better, he said.

Further, deleting a factual error when correcting a record could destroy vital data. Patterns of incorrect diagnoses often provide valuable clues to the research community, he said.

Most privacy laws advocate access to records by the data subject; in the case of medical records, however, the problem of "adverse effect" to the individual who learns the details of his medical or psychiatric problems was raised.

Those testifying for organizations covered by the Privacy Act of 1974 indicated they handled the problem by reviewing records before the information was provided to the data subject.

If a record is found to contain information that could harm a patient, a qualified doctor is provided to interpret the record or the patient is permitted to have his own personal physician interpret the record for him.

In cases where a minor is the data subject, no consensus was expressed on whether the parent should be granted access to the file.

Spokesmen from organizations that seek to prevent disease rather than treat it also reported special problems to the commission.

Dr. Bruce Dull, assistant director of the Center for Disease Control, said that organization needs access to secondary records – records maintained by laboratories, clinics, state and private health providers, employers, the National Institute for Occupational Safety and Health, the Internal Revenue Service (IRS), the Social Security Administration and even some individuals.

However, since the Privacy Act of 1974 became effective, the IRS will no longer provide individuals' addresses to the center, making location of people with communicable diseases far more costly, he said.

Review and Quality Control

Another facet of the medical record dilemma is associated with review and quality control of treatment.

"With the advent of peer system review organizations, disclosure of medical information to yet another group of non-federal third parties will be necessary," according to Marjorie Lynch, undersecretary of the Department of Health, Education and Welfare.

Testimony from Virgil Slee, president of the Commission on Professional and Hospital Activities, indicated medical records can be abstracted and identified with code numbers rather than names to insure the privacy of health records, without destroying the information needed to judge the quality of treatment.

Lynch recommended the commission take a "functional" rather than an omnibus approach in extending privacy legislation to medical records in the private sector. This would assure the appropriateness of the level of protection afforded to personal information of this type.

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Editorials

FCC Seeks Better Definition . . .

In reopening the Computer Inquiry [CW, Aug. 9], the Federal Communications Commission (FCC) has raised some serious questions about the validity of its approach.

The commission correctly noted that its earlier attempts to define services which were part DP and part communications were less than perfect. These hybrid services had been the cornerstone of the first inquiry decision and basically were designed to regulate those services which are primarily communications in nature.

The premise of leaving DP offerings free from regulation is supported by most industry sources. The problem arises in trying to define how many "incidental" DP features can be introduced with a communications offering.

This problem becomes more acute as AT&T begins to unfold its plans to provide specialized services to DP users. The first of these is undoubtedly the experimental Transaction Network Service in Seattle.

The boundary between communications and data processing is indeed being blurred. But this blur should not provide a facade to allow the carriers to slowly creep into the DP business.

One international expert recently defined a communications service under the proposed new definitions as "a service bureau run by a monopoly." The latest FCC inquiry might unintentionally lead to such a result. This is something the industry should be on the alert to prevent.

. . . But Users' Voices Needed

During the current Computer Inquiry of the Federal Communications Commission (FCC) [CW, Aug. 9], the user must make his voice heard.

Vendors of computers and communications equipment or services will be represented by lengthy briefs and pleadings before the commission.

Each of these special interests will claim to speak for the user and each will say its solution to the problems raised by the inquiry best serves user needs.

The special interests all represent a narrow, profit-motivated industry or industry segment. They will all couch their submissions in language that would make one think they are interested only in the public good and the good of the user. In reality they are all trying to get a bigger share of the computer-communications dollar in their pockets.

Users should not sit by idly. Instead they should write to the commission outlining their needs and views on the entire issue of computer-communications. These do not have to be lengthy, lawyer-written pieces — although users who can afford this type of effort should make it.

Rather, a flood of user letters demanding the commission consider user needs and problems will alert the commissioners that there are more people involved than just the firms in the business.

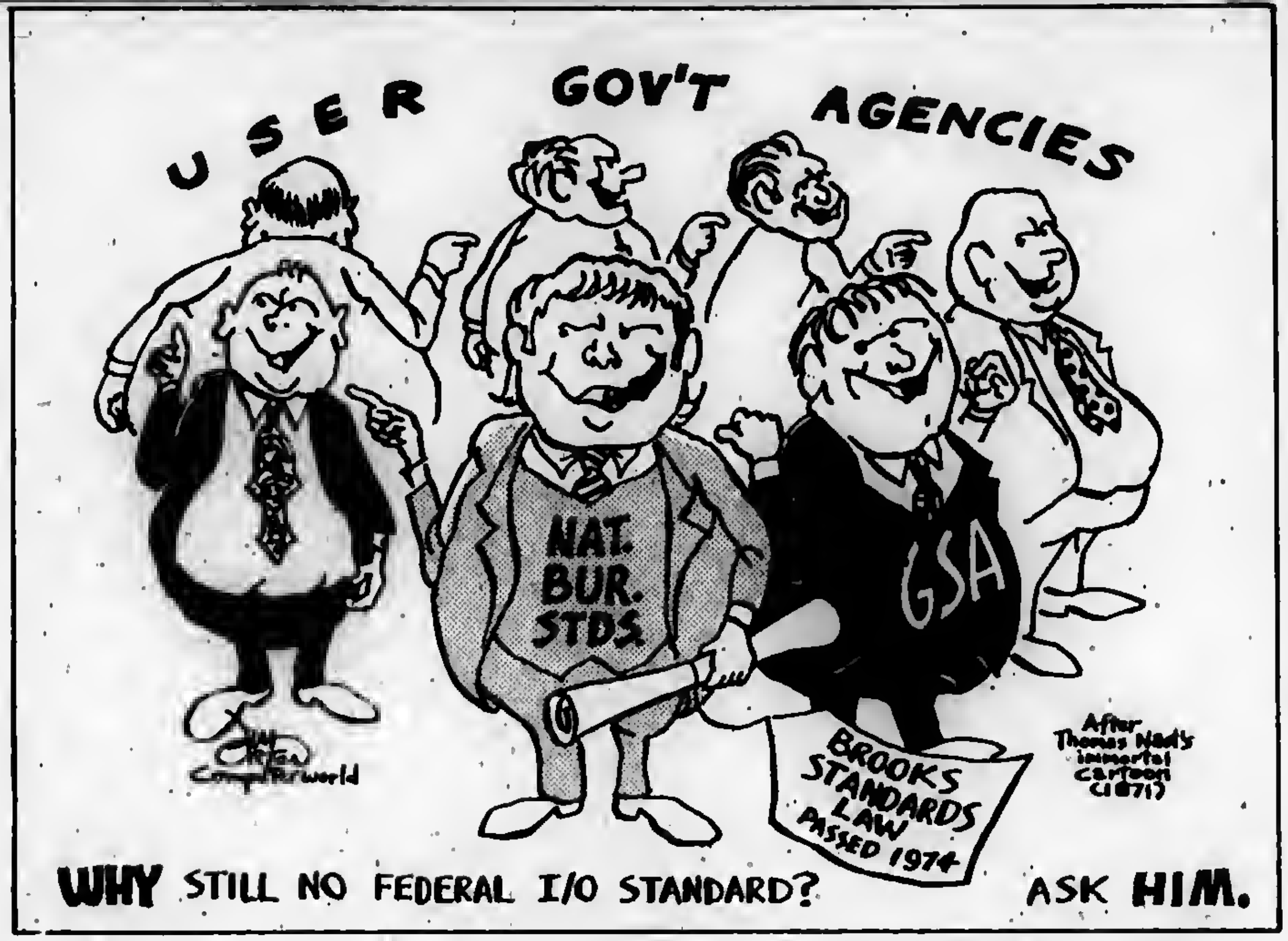
Perhaps the commission then will take the time and effort needed to explore those user problems through questionnaires and opinion surveys.

If users don't speak up, they will have nothing to complain about if their data communications bills get higher and higher. Only through concerted action will they get the message across.

It's up to you. Write today for a copy of the proposed regulations and make your voice heard.

The address is: Federal Communications Commission, 1919 M St., N.W., Washington, D.C. 20554.

Ask for the "proposed amendment to Section 64.702 of the commission's rules and regulations as set forth in Appendix A" and mention the Computer Inquiry.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WHY STILL NO FEDERAL I/O STANDARD?
ASK HIM.

Letters to the Editor

Lord Takes Name Too Seriously In Blaming Death on DP

Regarding the article by Kenniston W. Lord Jr. [CW, July 26], unless Lord has added a section on Saviorship to the exam for the Certificate in Data Processing (CDP) and passed that section, he is taking his last name too seriously.

Duane Tanner

Salt Lake City, Utah

Reality of DP Responsibility Seen

I've finally read something by Kenniston W. Lord Jr. I can agree with. His article on responsibility for DP-related deaths [CW, July 26] clearly pointed to a reality which may be hard for some of us to live with.

As DP practitioners, our toughest problem is to create systems which fit into a larger moral milieu than efficiency and effectiveness dictate. It started before "Do not fold, spindle or mutilate". It continues with invoices for $0.00. And it won't stop with the deaths of Frank Booth and Steven Karagianis.

Doug Chamberlin

Brighton, Mass.

A Plea for Creative Programming

Regarding Herb Grosch's column [CW, May 24], I have an MS in math and computer science and, after 5-1/2 years at IBM, I decided to try it on my own. My encounters with the "outside world" have not been entirely pleasant and one of the reasons has been the constant battery of tests I must face.

I want to talk of application packages and system philosophy, but instead I get questions testing my knowledge of language syntax and sign-on procedures.

Are there really so many charlatans in the industry that everyone is suspect? I find the insult to my professionalism so unnerving that I often appear less than totally competent.

I turned to computer science from theoretical math because of the joy of building something. The thrill of watching a system grow out of nothing but pencil and paper is unmatched by anything outside of the arts or crafts. Can it be that the creative aspect of computer science is obsolete?

Educators have long noted the inadequacy of testing and grading in teaching our children; hence we have nongraded, free-expression classrooms. They have focused on maintaining a creative environment and fostering independent thinking. Creativity cannot be ascertained in a test.

As Grosch stated in his column, the programmer should sign his work, as an artist or a craftsman.

The second bane of the creative programmer is structured programming. Perhaps the test takers would do well in a structured programming shop. I fully expect to hear in some future job interview: "I'm sorry, but creativity is unstructured; we cannot let you work here."

As I saw standards and restrictions creeping up on me, I escaped to APL, the last refuge of the creative programmer; now there is a book entitled *Structured APL*.

We need to appeal to the end user, the recipient of our efforts, and ask him: "When you buy furniture, would you prefer mass-produced Mediterranean modern or a hand-crafted piece, made with pride, that will last a lifetime and be a joy to use?" Let it be the same with computer systems.

Anita N. Benson
Software Consultant

Greenwich, Conn.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
Aug. 18, 1971

DETROIT – By restricting memory and peripheral processor components, Burroughs Corp. created two models for its 6700 Series mainframes – the 6711 and 6721. The CPUs only came in 1.5 μsec slow-access core memories, with ranges from 384K to 1,536K bytes.

— — —

WASHINGTON, D.C. – The U.S. Army "lost" 100 trucks valued at $1.5 million because they were omitted or incorrectly listed in its computerized management information system, according to a General Accounting Office (GAO) report. The GAO report declared the Army's system was "unable, with any degree of reliability, to determine its needs for equipment." The trucks were found after being in storage for almost a year.

Eight Years Ago
Aug. 14, 1968

NEW YORK – A short but sweet merger courtship between Western Union (WU) and Computer Sciences Corp. (CSC) was apparently broken up by AT&T when it threatened to suspend negotiations to sell its TWX service to WU.

— — —

CHICAGO – The Data Processing Management Association (DPMA) adopted a multilevel code of ethics for holders of its Certificates in Data Processing (CDP). The ethics code was recommended only for current CDP holders and was backed by the threat of possible removal of the CDP for code violations.

Part of the Solution

There is a well-known recent aphorism whose origin escapes me. It certainly goes back to the Sixties, and it scolds the uncommitted: "If you aren't part of the solution, you're part of the problem!" Now, in many areas of the human enterprise, that's arrant nonsense. Not because every living organism, from a new plant in a Balinese rice paddy to a space shuttle pilot in training, isn't interconnected; we all know that. But because many ferocious problems are so insulated from the efforts of ordinary people that the latter cannot to any measurable degree be "part of the solution."

We see cases where the insulation is distance: the famine-in-Tibet sort of thing. Or ingrained custom: the way universities are organized. Or ignorance, or basic shortages, or a dozen other barriers. In our discipline, the obstruction, at least for several computer generations, has been complexity. It is very hard for most computer people to be much of a part of practical large-scale solutions – and because most of us really desire to improve things, I repeat, it's unfair to say we're part of the problem. We want to do better. But how?

Well, back in the Golden Age, when we were hacking away in the problem thicket with simple hand tools, when we were close to our hardware and understood our software, three major ways of organizing began to function. The first was the technical/professional society: in this country, the Computing Devices Committee of the AIEE, the Electronic Computer Committee of the IRE, the Eastern Association for Computing Machinery, the punched card group in the American Chemical Society, informal subsets of the National Machine Accountants Association and the Systems and Procedures Association. They flourished, as did their foreign counterparts and their later-coming competitors and supplementers.

The second was the User Group, manufacturer-oriented user cooperation. SHARE was first, about seven years behind the ACM sort of thing; now there are dozens, with more starting up every year. In fact, the last two years have seen the hobby enthusiasts calve off microprocessor user groups in rapid succession: another source.

And the third was the standards "movement," the organizing of people and practices to reduce the agonies of interfacing and incompatibility. For computer people, it began to matter at the beginning of the Sixties.

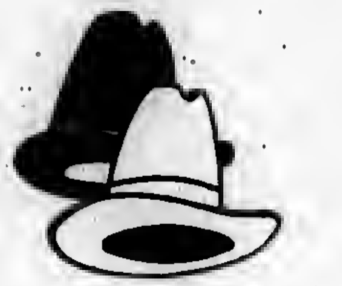
Trouble was, the complexity increased in our trade faster than we could organize to cope with it. When electrical power came in, it spread slowly; interconnections were minor; economics improved over decades, not months as in our fantastic business. Societies and user outfits – yes; the fancy one, the IFIP of that technology, is called CIGRE, the international committee on large power networks – and standards organizations had time to grow up and interact. Not so with us. We did try to federate. There was AFIPS here, regional arrangements, and of course IFIP. And not just the professional societies; there was/is a Joint Users Group, intended at least in part to concatenate user libraries and share horror stories about suppliers. There were federations of standards groups, especially across national boundaries. But to federate is to move slowly, and many of the supergroups acquired a life style and a ladder of executive advancement all their own.

Clearly the time is coming to integrate in another way. Not, I think, to casually discard what we already have, but to link the people underneath these organizations along different, additional channels: orthogonal to what we do now, mathematicians would say.

There were first hints of this back at an early Rand symposium, in 1959. Herb Bright and I drew crazy charts on the chalkboards showing ways of tying together the ACMs and the SHAREs and the standards committees (pre-X3 and -X4). But it was at once too soon – the need was not great enough – and too late – the outfits were already too big and powerful.

A better way is to interlock people themselves, not just paper structures. People are multifunctional; they enjoy switching hats. But an ANSI, a Honeywell User Group, a DPMA finds it hard to do so.

And where do *people* interact? Well, in a word, locally! I would like to see new attempts at local integration: Washington denizens have made some tiny beginnings; Los Angeles is a natural; San Francisco and New York have geographical problems. In a sense, computer people in countries with centralizing capitals (London, Paris, Copenhagen) already do this, and because of the ease of contact work more efficiently than we. But they do not, in London and Paris at least, formally attempt to link their societies, user groups, and standards activities. I believe it can be done, and done quickly, right here. A catalyzing person (a Carl Hammer in Washington, a Jean Sammet in Boston, a Herb Safford in Los Angeles), a couple of organizing meetings, some support money from rich local chapter coffers . . . one success would be enough. Projects are heaped up on every side: advice to local government is an obvious one; performance measurement efforts; consumer interactions. Complexity is our barrier. It is what keeps most of us from being part of the solution. We need simpler ways of working together.



Herb Grosch

Protecting User Rights Makes Systems More Accepted

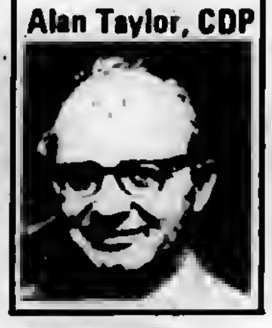
Manufacturers Hanover Trust has set up an Automation Steering Committee which monitors the progress of all its projects.

The committee has members from all the right sources (auditing, internal bank operations, international, corporate finance, etc.) at the right level (upper management). It has been organized to have a strictly defined set of responsibilities (approval is needed for projects over $25,000; projects over $150,000 must go to the Senior Priorities Committee), and it is part of a well-thought-out system of controlling project development.

The Taylor Report

By

Alan Taylor, CDP



Unfortunately, the system employed by the committee is fundamentally biased against computer users, who are left at the mercy of their more technical colleagues through the use of a series of insidiously worded forms that have no place in a technical establishment.

The forms used include the Project Initiation Form, Work Commencement Notice, Feasibility Acceptance Agreement, System Acceptance Agreement and the Variance Approval Form.

The antiuser bias starts right in the Project Initiation Form. Here, in tiny print at the bottom, the user is told Systems and Planning (SAP) will *automatically and immediately* go on to develop the system after the initial survey (and bill the user department) unless specifically told to cancel the project.

The user is given no time to consider the results of the initial survey report, and these certainly need considering. After all, the documentation is specifically regarded as a contract between the user and DP.

Under the system in the documentation, by the time the user has discovered the anticipated operational costs of the new project (which do not appear on the documentation anywhere), bills can be run up against his department for an unwanted project.

A reasonable system would, at least, give the user some thinking time after the receipt of the initial survey and before any bills could be charged.

Actually, to be evenly balanced, the initial survey results should be binding on the SAP people for about 30 days; and the user would have to explicitly initiate further work. Then, both sides would get their contract rights protected.

Trend Goes Downward

After this inauspicious start, the trend, from a user's point of view, goes downward.

In the Work Commencement Notice, he gets the right to request that the work goes on (which seems to mean anything that the SAP people let it mean – there is no description beyond completion date, estimated costs and system name). SAP is not required to do anything and, certainly, not to stop working if the estimates are not being met. Again, a one-sided system.

However, the Work Commencement Notice is at least addressed to the user. By the time the Feasibility Acceptance Agreement comes around, the user is relegated to being just one of eight approval signatures.

The only term of the agreement is that, based on some time and cost estimates (but no operational specifications apparently), the user is paying all the bills charged, whether or not the estimates are met.

He has no recourse except to fully approve the agreement and the attached proposal. There are no restrictions written into the so-called agreement; there is no way of resolving the inevitable ambiguities of the SAP documents; there is nothing that protects the user's position and nothing that can hurt the SAP area.

Acceptance Before Use

The worst area, however, is the so-called System Acceptance Agreement. Factually, this is just another milestone in development when the original programmers are taken 'off the hook' and the maintenance area is put onto it.

Manufacturers Hanover has, for its own reasons, decided to let this changeover occur before the system goes into operation in an environment, other than a testing one. Here the user has to agree to let SAP off the hook on everything (whether the system agrees with the proposal or the specs) before any live use of the system occurs.

This entire system is ridiculous. There are no acceptance tests that can properly protect a user's rights before a system is running.

It is very easy for a user not to know about problem areas for months afterwards and under this system he can only go back to the maintenance and operations people (technical support group and DP department). But under the System Acceptance Agreement their role is strictly limited.

True, they have reviewed the system and have the documentation. But, they have not compared it to the original specifications or seen how it rates in view of the original cost justifications, etc. These essential items are just left floating.

Even the project leader, as he is let off the hook, makes no reference to them, no statement that the system meets specs or anything. The forms designer saw to it he wasn't asked to provide anything except yet another estimate (DP running costs).

'Pass-the-Buck Agreements'

These types of pass-the-buck, boiler-plate agreements are not technically valid. Technically, any agreement between the development group and the user should be based upon either considerable actual experience (as through a complete annual cycle) or upon the accuracy of technical estimates, programming, etc.

A user just isn't in the position to know whether promises are being kept or information is valid until he has used the system and even added to it later.

Asking him – or rather requiring him – to give up his rights to internal boiler-plate contracts may be administratively effective, but is technically improper.

I hope Manufacturers Hanover will review and change its policies soon so they don't work just because the users are a captive market, and don't rock the boat.

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When It Comes to Manuals

Too Many Examples Better Than Not Enough for User

By Joseph T. Rigo
Special to Computerworld

Everyone knows examples are important in user manuals for a computer system or software package.

Everyone knows, so everyone includes them. Or at least they try.

For example . . .

Way back in the dim mists of ancient history, I was the tech writer maintaining the Fortran IV and Basic Fortran language manuals for IBM's 360. My job was to write new material for the manuals, correct errors and draft answers to comments from customers.

The Fortran manuals were widely used, so we got a lot of comments, but a couple of sections of the manual escaped serious criticism. One of these quiet spots was a five-page example at the back of the Fortran IV book.

The purpose of this example was to show what a complete program might look like with all the statements in their proper place. The person who originally wrote the book was a math major, and he chose a complex math operation as a basis for the example.

The example showed two or three pages of math notation followed by equivalent Fortran code. The math portion was filled with superscripts, subscripts, sigmas and other symbols to delight the eye. We never paid much attention to it.

One day we received a 200-page reader comment from something called The Polyquestion Society. The society turned out to be a student group at what was then the Brooklyn Polytechnic Institute. It had carried out a project to find at least one error on every page of the IBM Fortran manual.

Some of the society's discoveries were good. Others were pretty far fetched. But it really had a field day on the math example.

In those primitive days the basic text was on tape, but the superscripts, sigmas and other symbols had to be hand-pasted onto the camera-ready copy. This job had to be repeated every time we revised the manual, and we were constantly leaving out symbols or putting them in the wrong place.

The point is that no one noticed. No one complained, because no one ever used the example. Even the Polyquestion people were looking for something other than an understanding of Fortran.

The example was too big, too complicated and too specialized. It was easier for a user to go down the street to buy one of Dan McCracken's books about Fortran programming than to wade through the thing.

I would like to be able to say that we replaced it immediately with a couple of smaller, more useful examples. But change takes time at IBM. The last time I looked, it was still there.

Many vendors make the mistake of pinning all their hopes on a single big example. They use one or two illustrations to demonstrate every bell and whistle in their system. Each example becomes hopelessly confused and complex.

It is all right in a classroom situation to cram everything into a single example. The instructor keeps attention focused on a single element at a time.

But the user of a reference manual is confronted with the whole mess. He must spend time finding the part that applies to his immediate problem. He may even have to go to other parts of the manual just to get background information about the example.

Reader Commentary

This is irritating to the best of users. It is even worse to someone who is in the middle of a problem at a terminal whose meter is running.

The real need is for lots of examples at all levels. One way to look at this requirement is to compare it to the problems of a programmer who is working on code to edit input.

First, the program must examine each parameter, key word or data field as an individual entity. Then the program must check on the field's use within the card. Next, it examines the field's consistency with entries in other cards. And so on.

Similarly, a manual may need an example of each parameter. It need not be much; a single word or line may do. But it should appear on the spot with the basic explanation of the parameter, not at the end of the chapter.

The immediate example helps the new user enormously. It also aids the experienced user who is checking up on a small but important point.

Another set of examples is necessary at

(Continued on Page 16)

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Read our special report on *Supplies and Security* in the September 27th *Computerworld.*

Harry S. Truman, in his oft-quoted phrase on our improvident ways, admonished us to "Use it up, wear it out, make it do, or do without." As much as it made sense to the sugar-saving housewives of 1946, that wartime motto is excellent advice for the computer rooms of today. Our September 27th supplement, titled *Supplies and Security*, takes that advice, and we'll show you some innovative ways to save money by conserving supplies.

Edited by Drake Lundell, this Supplement will cover all the things you feed your computer system, including tapes, disks, cards, paper and forms. Miniaturization of the supplies you use has the added benefit of saving storage space as well as using less material -- and this supplement will examine equipment that does this, such as computer output microfilm and photo-reducing copiers.

We'll also address the subject of security in this report. Diabolical threats like dust, excess humidity, fires, floods, theft or sabotage could bring your computer operations to a grinding halt. We'll review the risks -- especially in the area of physical security -- and report on ways you can reduce your exposure to them.

Anyone who manages computer systems will find important and useful information in our September 27th supplement. And if you're a marketer of computer supplies or security products or services, you should advertise them here. Ad closing date is September 10th. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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'Good Guys' Finally Won One

Rochette Case Harbinger of DP's Future

By Kenniston W. Lord Jr.

Special to Computerworld

For Eugene Rochette, a "computer error" and all its attendant problems now means he has been bankrupted into wealth.

But it wasn't always that way. Back in 1974, Rochette's business was forced into bankruptcy by a pattern of "computer error" on the part of France's second largest bank, the state-owned Credit Lyonnais.

Rochette, a fruits and vegetable wholesaler in St. Alban du Rhone, a suburb of Grenoble, France, had paid his suppliers with checks totaling $25,500. The bank proceeded to return the checks, marked "insufficient funds."

As a result, Rochette's suppliers refused to sell to him and he was immediately blacklisted by them. Rochette then lost his largest customers, primarily supermarkets, since he could not supply them.

And all the while, there were more than sufficient funds to cover the checks he had drawn. The declaration of bankruptcy came later that year in the Commercial Tribunal of Vienne, near Grenoble.

But right is right, and no "computer error" would stop Rochette, who immediately set about to sue Credit Lyonnais for its misdeeds. Last September, the Commercial Tribunal found in Rochette's favor and ordered Credit Lyonnais to pay $149,000 in damages. The bank proceeded to appeal and the appeals court nearly doubled the award to $290,000 in July [CW, Aug. 2].

In traditional fashion, Reuters news agency attributed the foul-up to "computer error," totally ignoring the fact that "computer error" is really a misnomer for "people error," for Rochette most certainly must have tried to get people to do something about the problem.

Still, it seems, the problem persisted, and Credit Lyonnais is now left to lick its wounds, having paid out nearly 12 times the amount of funds originally in dispute. Clearly, to Credit Lyonnais, the ability to feign anonymity behind the computer can no longer be valid.

Precedent Set

More importantly, however, is the fact that an important international precedent was set in that French court. For the first time, a consumer disadvantaged in a major way by a computer-based company won a major anticomputer battle.

One can only wonder what the implications can be for American business and American consumers.

This country has long been overdue for consumers to stand up and be counted regarding the callousness extended by those firms which use the computer as the excuse for poor personal service. Where we do hear of a major suit, such as Smith vs. J.C. Penny, how is it that we never hear of the adjudication?

Could it be that the case, like so many others, has been quietly settled out of court? Could it be that the consumer advocates of this country have been happy merely to handle individual cases on a one-by-one basis with little reporting of the entire pattern of consumer-computer abuse?

Where are Common Cause or Nader's Raiders when it comes to things like this? Could it be that adept and polished public relations people are quietly keeping the whole thing on the hush while incident after incident is "handled"?

How is it that the populace is willing to stand by while one firm after another collects data about it, fends off complaints with smooth talk and uses the data in a policy untouched by existing regulation? The answer – at least the only *apparent* answer – seems to lie in the fact that no single individual has been so seriously disadvantaged to make an issue of it.

Further, it has not become important enough as yet for any organized DP "professional" society to do its part to educate the populace to the point that it knows what specific requests to make and what specific actions to take.

...And in This Corner

It is, after all, unlikely that those who would benefit most from the shield provided by the "computer mystique" would take steps to see that shield removed.

As pointed out in a recent *Infosystems* editorial, the pattern of legal action is increasing, not decreasing. On the heels of the initial IBM vs. Catamore decision [CW, July 9, 1975], firms are now finding courts will favor the specific performance offers of hardware and software vendors.

A recent issue of that magazine devoted its cover story to DP malpractice, giving credence to this author's predictions in 1973. At the moment, such malpractice seems to have settled at the organizational level. But having done that, can it be long before it settles at the personal level?

So the time seems right to make another prediction: The time is coming when a firm will be forced to conduct business, even credit business with its eligible clientele, while at the same time being legally enjoined from using the computer to support that business.

When that occurs, the difficulties anticipated vis-a-vis privacy concerns will seem miniscule in comparison, for a highly automated firm may well be required to operate dual systems to conduct its business.

At the same time, there will be a movement to assign personal responsibility for computerized actions and frustration.

As long as firms are permitted to construct and use computer systems with no expressed guarantees to the persons they purport to serve, as long as firms are permitted to construct and use systems with no mandatory design standards employed or enforced, as long as firms are able to treat their customers with impunity through the thin veil of "computer error," the situation may well continue and may well be excused at the insistence of well-meaning consumer advocates.

But there seems to be ample evidence that the veil is fast disappearing as people come to understand their rights and the fact that their real adversary is not the computer itself, but rather the people who use the computer.

Eugene Rochette was able to turn his misfortune into fortune solely because he had the courage to counterattack. Such counterattacks may soon catch on and go beyond the destruction of the payment card as American consumers read of Rochette and others who are sure to follow.

Yes, the "good guys" finally won one, but at the same time we should begin to recognize that what we have seen is merely the harbinger.

Where's Solution?

There's the problem; what's the solution? The solution, it seems to me, lies not in maintaining the status quo, but instead undertaking a major overhaul of our thinking, of the traditional policies, practices and toothless "standards" – voluntary, of course – which have advanced us to where we are now.

The solution lies in an industrywide statement of acceptable practices, adopted as legal-based systems construction and audit criteria.

Who is going to do it? It seems that none of the so-called "professional societies" are about to do it. It's certain that the American National Standards Institute and the American Federation of Information Processing Societies will not do it. It's certainly not in their best interest to do so.

But there is indication that such a codification of practices may well come out of efforts at the Institute for Certification of Computer Professionals (ICCP), efforts growing out of both the licensing upheaval and the recognition that one cannot apply standards of performance measurement against people until standards of performance are determined for the tasks they must perform. That effort has only been three years in the formulation, merely one-eighth of our computer history.

Organizations, however, have a functional upper limit. Most are so concerned about their politics and proliferation that their forward progress is measured in inches, not in feet.

The next action, it seems, must be taken by individuals assigned to their organizations – individuals who recognize that the "chickens are on their way home to roost," and soon, and who recognize that if their functional organizations do not take action, then legislators will.

For Eugene Rochette, who today counts in feet and not in inches, a major victory has been won, and that is good. But for you and me, while the end may not be in sight, clearly the direction has been established.

Now what are you going to do about it?

Manuals Lack Needed Examples

(Continued from Page 15)

the card level. The manual might show one card with all possible fields filled in. Another example could show a more realistic situation where, often, some fields might not be used.

The third level might combine different cards related to a single user function. For example, most report program generators or report writers permit a user to make calculations during processing. They have one type of card to specify the calculation; another defines new data fields or variables to hold the results of the calculation.

Vendor manuals commonly show the cards separately. The cards do not appear as a functional unit until the big example at the back of the book, where they get lost in the mass of complexity.

Finally, there is the big example everyone loves. In fact, hopefully there are several.

The big examples illustrate the capabilities of the system and varying user applications. Again, they should be simple to the extreme. A point is being illustrated, and it should not be buried in the implementation.

In reality, it is difficult to include too many examples at any level. The worst error is to try to get off easy by forcing one example to do more work than it can handle.

Remember, the Polyquestion Society may be watching.

Rigo is president of Sysdoc, Inc., a New York-based documentation consulting group.

Achieves 'Modest Degree of Success'

Firm Aims Course at Smoothing User-Analyst Relation

By Don Leavitt
Of the CW Staff

ALEXANDRIA, Va. – While there is general agreement that improvement in user-analyst relations is needed and some disagreement on how to bring about that improvement, Mobil Oil Corp.'s International Division has had "a modest degree of success" with a two-day "Project Management for Users" course, according to E.V. Halpern.

Speaking at a recent symposium here on "The Systems Analyst in Perspective," the director of Mobil International's training effort said his program has two prime objectives. One is to suggest a means of overcoming the user's start-up inertia; the other is to open a dialogue between user and analyst.

In the first instance, the user needs to be shown how to get involved. In the second instance, the user gets the message to "make sure the analyst knows what he is doing," Halpern said.

The presentation is made more meaningful, he continued, by having analyst personnel present and participating and by using an audiovisual course titled "Users Guide to Data Processing Management" prepared by the Data Processing Education Network.

In his training, the user is shown that the extent of his involvement varies from one phase of a project to another, but that initiation is where he is most involved and where his contribution is "both important and necessary. He must play an active role if the project is to succeed," the Mobil spokesman noted.

Within the course, the initiation phase starts with an idea on the part of the user. But Mobil shows him the need for a checklist that asks questions about the number of records, the means of recording and filing data, record activity and time constraints.

As both the capabilities and the limitations of the DP equipment are brought out, the checklist is expanded and tradeoffs are gradually recognized by the user.

The end of the feasibility study is another go/no-go checkpoint for the system. If both the user and the analyst have done their jobs properly, the user should be beginning to understand how decisions governing projects are made "and this is really the goal of the user involvement process," Halpern added.

Peopleware

At this point, Mobil's instructors suggest the user prepare a project proposal. The request should describe the old system if there was one, state the problem and tell how the new system will operate. It should finish with a statement of costs and benefits as they are defined at this preliminary stage, he said.

This can be a "very useful communications tool" even at this early stage, Halpern said, noting the user can do an adequate job only if he fully understands his desires.

User involvement of this nature "will have the effect of slowing down the initial phases" of system development.

But "if we spend more on the 'front end,' we should be able to recover these costs by savings on the 'back end,' " he added.

'Refs' Provides Security for IMS Sites

WAYNE, Pa. – The Remote Entry Flexible Security (Refs) package is a data security system which can be used by any application requiring controlled access to specific IMS transactions, according to its vendor, Suntech Computer Services.

Designed for use with IBM 370s under IMS/VS version 1.0.1 and up, Refs is said to provide more control, flexibility and efficiency and require less overhead than IMS by itself.

The added control is available through the limited transaction list available to each user, Suntech said. On the other hand, flexibility is enhanced since entrance to the system can be from any registered IBM 3270 CRT terminal, the firm noted.

Aids Terminal Efficiency

IMS-supplied terminal and password security features can be used in conjunction with Refs, but the Suntech software permits more efficient use of the terminal, a spokesman continued. Unlike the IBM password facility, Refs requires the user to enter his unique identification code only once, he added.

While a traveling operator gains the flexibility of being able to perform work from any terminal or location, the operator/user who opens a terminal through the sign-on procedure is responsible for activity at that terminal.

When leaving the terminal, therefore, the operator must sign off to prevent unauthorized use of the device and of the transactions available to the operator, the spokesman noted.

Transactions may be added or deleted from an operator's authorized list at any time after approval of the appropriate installation management. Actual maintenance of the security data base is handled on-line.

Written in Cobol, Refs imposes several restrictions on its users. All security displays, for example, are designed for the 3270 Model 2 large-screen CRT, and data base DBGENs specify 3330 disk packs as the storage medium for all security files.

Refs source code is available for $1,500 from Suntech at Suite 350, 7 Executive Mall, 680 E. Swedesford Road, Wayne, Pa. 19087.

Tracks on CPE, Engineering Slated for Eurocomp

LONDON – Computer performance evaluation (CPE) and software systems engineering will be the subjects of two separate but related conferences that make up the European Computing Congress (Eurocomp) to be held at the Heathrow Hotel here next month.

About 70 papers will be presented in the sessions scheduled for Sept. 14-16. Together they will present "a comprehensive appraisal of current thinking, research, planning and experience in these two areas," according to the sponsoring organization, Online Conferences Ltd.

Although speakers will come from all across Europe as well as the U.S., all presentations will be made in English, Online noted.

Kiviat to Speak

The CPE portion of the program will be chaired by Philip Kiviat, technical director of the U.S. government's Federal Computer Performance Evaluation and Simulation Center (Fedsim). The software engineering sessions will be led by Prof. Brian Randell of Newcastle University.

CPE session topics will cover performance management, network performance, system measurement both in theory and in case studies and simulation of computer systems. Workload definition, modeling and approaches to systems evaluation will also be considered, Kiviat said.

The engineering sessions will cover new approaches to system structuring, design tools and techniques, languages and operating systems. Software management, systems reliability and testing and validation will be covered in other sessions, Randell noted.

The registration fee for Eurocomp, which covers attendance at any of the sessions in either subject area, lunches and receptions, is approximately $250. Further information is available from Online Conferences, Cleveland Road, Uxbridge, Middlesex, England.

G&W Designs Basic System for GA Minicomputer

CORAL GABLES, Fla. – A business-oriented Basic compiler and data management system has been developed for the General Automation, Inc. (GA) SPC-16 minicomputer by Geigel and Williams Systems, Inc. (G&W).

The package supports all Basic indirect commands defined by the American National Standards Institute draft standard, the vendor claimed.

G&W Basic runs under standard GA operating systems with supplementary – optional – modules for simulating channel programs and providing dynamic terminal and disk buffering. These modules provide rapid response and high throughput in a swapping environment, a G&W spokesman added.

As implemented by G&W, Basic supports sequential, relative record and Isam files for both private and "public" use as well as interactive file creation, according to the spokesman.

Protection and synchronization primitives in the form of logical reserve, enqueue and dequeue operators are also part of the language, he noted.

Application programs from G&W were designed to access integrated data bases on an interactive, multiterminal Basic. Currently in the library are accounts receivable, accounts payable, general ledger and payroll as well as order entry, inventory control, purchasing and shipping and receiving control routines, the company said.

The package can support four terminals on a 32K-word SPC-16 with a fixed-head disk without response time degradation or thrashing, the spokesman added.

Licenses for the G&W Basic, data management system and application library are available for $2,000 from the firm at 1301 Campo Sano, Coral Gables, Fla. 33146.

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'EMS' Service Aids Planners

NORWALK, Conn. – The Economic Modeling System (EMS), now on the National CSS, Inc. (NCSS) network, enables users to build and then work with complex data bases of their business operations; to analyze trends and patterns; and to forecast elements such as sales, expenses and profits, the vendor said.

With EMS, a user can perform all the tasks associated with business modeling and forecasting, NCSS claimed. Support is available for data organization, documentation and storage; data manipulation and transformation; equation estimation; model construction and simulation; and display, a spokesman added.

Data management facilities within EMS handle time series data. They feature automatic dating of observations and conversion of different frequencies to a user-defined standard, he said.

EMS capabilities include leads, lags, conventional algebraic and logical operators. Regression equation estimation capabilities include the use of algebraic transformation within the regression equations, according to NCSS.

All capabilities are executed with English commands, and the number of commands needed to accomplish a task has been reduced through the use of options within commands, he said.

Within EMS, each time series may be accompanied with descriptive text. Every aspect of a user's work (data, equations, parameters, models, forecasts, etc.) may be individually documented.

The NCSS network can be accessed from major cities in the U.S. and Europe. The firm is headquartered at 542 Westport Ave., Norwalk, Conn. 06851.

Debugger Manages Data Checks In IBM 360/370 Environment

ROCKVILLE, Md. – The PRI Debugger from Program Resources, Inc. (PRI) is a program test aid used to bypass some types of program errors in an IBM 360/370 environment in order to provide the user with a more comprehensive test run, according to a spokesman.

Written in BAL, the debugger is called by a source program written in BAL, Cobol, Fortran or PL/I. It becomes part of the object program: one statement is added to each program and a data definition card is used for selective dumps and diagnostic statements, he said.

With the test support code in place, the user gains automatic correction of data exceptions, with reexecution of the originally unacceptable instruction, or display of specific diagnostics where a logical program error is detected.

While there are a number of packages already on the market that cope with data exceptions in test runs, PRI claimed its diagnostic messages separate its debugger from all the rest. The thousands of operating system messages are reduced to 400, "accounting for most commonly encountered program errors," according to PRI.

Once an error is detected, the relative and physical addresses are noted, a narrative explanation of the error is documented and the probable cause is noted, the spokesman said.

The data exception handling is allowed only as long as certain predefined thresholds are not exceeded, the spokesman added, noting that without such control a test run could continue to unusable extremes.

Requiring only 2K bytes of storage, the PRI package is available in object code for a single installation for $300. Source code and license for unlimited usage costs $2,000, the spokesman noted from Suite N 1009, 12000 Old Georgetown Road, Rockville, Md. 20852.

Floppy DOS, Basic Available for 8080

MOUNTAIN VIEW, Calif. – A floppy disk-based DOS and an extended Basic language facility are available for use with the Intel 8080 microprocessor in a software package from Intelligent Computer Systems (ICS).

The DOS manages system resources and supports as many as eight disk drives and four open files in concurrent use. Sequential and random access methods are both provided, as is an assembler, in addition to a debugging package for assembly programs and a text editor, ICS said.

The Basic software includes both a "compiler" that generates intermediate code and an interpreter that uses the code to execute the programs.

Language features included far exceed the minimal Basic specifications currently under American National Standards Institute (Ansi) study, the firm said.

Instructions are included that permit users to use DOS capabilities directly, rather than through separately coded Assembly routines.

The DOS-Basic combination package requires "no more than 16K bytes of memory and one floppy disk" and is available under license for $500.

A package supporting teletypewriter/CRT asynchronous low-speed communications with an IBM 360/370 is also available for $500, the company said from Suite 40, 777 Middlefield Road, Mountain View, Calif. 94043.

'Dapl' on RCC Network Backs Microprogramming

LOS ANGELES – A general-purpose microprogramming language called Dapl is now accessible via Remote Computing Corp.'s (RCC) nationwide toll-free network.

The product currently supports Advanced Micro Devices' AMD2900 and Fairchild Semiconductor's 9400, and will soon support Motorola Inc.'s 10800 and Monolithic Memories, Inc.'s MMI 6700, the company said.

Dapl allows the microprogrammer to select any of four levels to provide a symbolic representation of his microprograms. Macros and symbolic values are allowed at all levels and Dapl allows microprograms from 8K words by 256 bits.

RCC is at Suite 1400, One Wilshire Building, Los Angeles, Calif. 90017.

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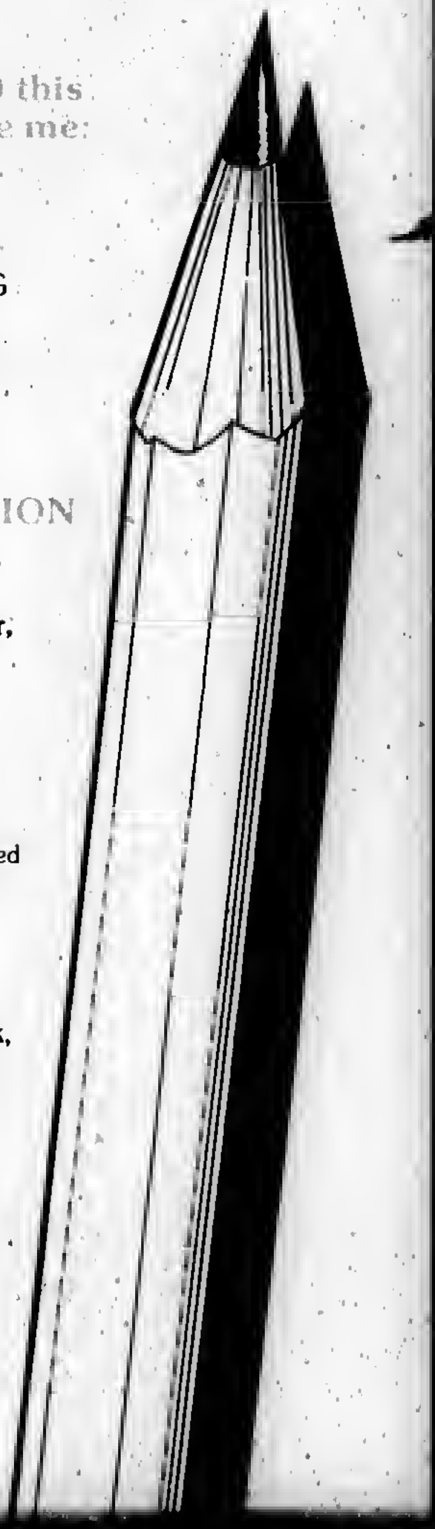

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Cullinane Information System 1:00-3:00 p.m.

An introduction to the direction the Cullinane Corporation is taking in providing their clients with a complete information system. Cullinane developments include a Data Dictionary, The SHADOW II Communications Monitor, On-Line Query System, Distributed Data Processing and Mini-Computer versions of IDMS. Also covered will be the CULPRIT Retrieval System and user department versions such as EDP-AUDITOR and EEO-AFFIRMATIVE ACTION REPORTER.

Social 3:00-4:00 p.m.

Opportunity to discuss specific questions in depth with members of the Cullinane Corporation Technical and Management Staffs in a relaxed and casual environment.

Seminar Leaders

Robert J. Davis — Mr. Davis is Regional Marketing Manager for Database Systems. He has extensive experience with most aspects of database system design and usage, and has held key positions with both IBM and CINCOM. He is responsible for the marketing of database products in the U.S. and Canada, analyzing competitive products, and finding new markets for database technology. Mr. Davis holds a B.S. degree from the University of Akron.

William E. Linn — Dr. Linn is a member of the Cullinane Corporation Senior Technical Staff. His responsibilities include IDMS training, database consulting and technical marketing support. He was previously with Southern Railway System in Atlanta where he was deeply involved with database administration activities with IDMS. He has his Ph.D. in Computer Science from the University of Michigan and has been associated with the Georgia Institute of Technology teaching data structures and list processing techniques.

Raymond J. Nawara — Mr. Nawara is Southwest/Plains Area Manager of Cullinane Corporation. He has had extensive experience with the design of health and patient-care systems. Previously he was the Data Base Administrator at the Health and Hospitals Governing Commission of Cook County, Illinois where he had extensive experience using IMS. He has consulted in Database Applications for a variety of clients. Mr. Nawara is a graduate of the University of Houston with a major in Mathematics and Computer Sciences.

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Utility Eases OS, VS Chores

COLUMBIA, S.C. – The Multi-Function Data Set Utility Language (MFDSUL) was designed to provide IBM OS and OS/VS programmers with a simple means of writing customized data management and utility programs, according to the vendor, Diversifiedata Services.

The variation of DP tasks that can be done with MFDSUL "is left to the users' skills and needs," a spokesman noted. Common tasks are data selection, test data generation, report writing, file modification and correction and record display, he added.

The package's facilities can also be used for file-to-file conversions, "unit record functions" and logical data manipulation, he said. MFDSUL includes a vocabulary of 25 mnemonic instructions and functions as an "assemble-and-go" operation, the vendor explained.

MFDSUL supports as many as two input and four output data sets and two print files. All standard devices types are supported and data set organization may be sequential, indexed sequential, Vsam or partitioned, the spokesman added.

The package includes an "automatic read" option which generates appropriately timed reading instructions without user coding; this would be used most often for simple tasks, the company said.

A user-controlled exit facility which allows the use of routines written In Assembler, Cobol or Fortran permits the use of logic beyond the limits of the MFDSUL instruction set.

MFDSUL requires 36K bytes of main memory and is available for $2,650, Diversifiedata said from Suite 406, 240 Stoneridge Road, Columbia, S.C. 29210.

Goal-Directed Coding Approach Illustrated by 'Silly Program'

By Richard J. Cichelli
And Martha J. Cichelli
Special to Computerworld

Concepts and Techniques

Goal-directed programming (GDP) [CW, Aug. 2] is most easily illustrated by an example. Edsgar Dijkstra posed the following programming problem:

You are given two subroutines – READCH, which reads a single character, and WRITECH, which writes a single character. Given an input sentence, write a copy of it such that (1) extra blanks are eliminated and (2) every other word is written backward. The input sentence:

```
        this   is   a silly    program.
```

would be written:

```
        this si a yllis program.
```

(Because of this example sentence, the program became known as "The Silly Program." See "Notes on Structured Programming" in *Structured Programming* by Dahl, Dijkstra and Hoare.)

To simplify the program, sentences are defined as being one or more words, each word separated by one or more blanks. Sentences end with a period, and the maximum word length is 20 characters.

The solution to this problem will be presented in Scobol (an extended form of Cobol developed by Lars Mossberg of Volvo Flygmotor and implemented with a precompiler).

In our earlier article, we wrote a program to copy a sentence:

```
REPEAT
   CALL 'READCH' USING CHAR.
   CALL 'WRITECH' USING CHAR.
UNTIL (CHAR = PERIOO).
```

In the second version of our program, the new goal is to eliminate extra blanks.

The final article in this series will show how GDP techniques can be applied to debugging and documentation, how they apply to large systems and what tools are available to make GDP easier.

To do this we must ignore any blanks which precede the first word, extra blanks between words must also be discarded.

Note that we cannot write a blank immediatley after copying a word; we must first find the next nonblank character because we do not want to write a blank before the period ending the sentence.

```
 NOTE-GOAL=SKIP LEAOING BLANKS.
 REPEAT
   CALL 'REAOCH' USING CHAR.
 UNTIL (CHAR NOT = SPACE)
 NOTE-GOAL=COPY REST OF SENTENCE.
 REPEAT
   copy rest of sentence
UNTIL (CHAR = PERIOO)
```

The goal "copy rest of sentence" can be decomposed into the three subgoals, "copy a word," "get the next nonblank character" and "write either a period or a blank after the word." This portion of the program is expanded:

```
 NOTE - GOAL = COPY REST OF
 SENTENCE.
 REPEAT
   NOTE - GOAL = COPY A WORO.
   REPEAT
     CALL 'WRITECH' USING CHAR.
     CALL 'READCH' USING CHAR.
   UNTIL ((CHAR = SPACE) OR
   (CHAR = PERIOO))
   NOTE - GOAL = GET NEXT
   NON-BLANK CHARACTER.
   WHILE (CHAR = SPACE) OO
     CALL 'REAOCH' USING CHAR.
   ENOOO.

   NOTE - GOAL = WRITE PERIOO
   OR BLANK
   IF (CHAR = PERIOO) THEN
     CALL 'WRITECH' USING PERIOO.
   OR
     CALL 'WRITECH USING SPACE-CHAR.
   ENOIF

 UNTIL (CHAR = PERIOO)
```

REPEAT and UNTIL are Scobol keywords which implement one of the D-structures (Dijkstra) for conditional repetition. Since the termination test is at the end of the sequence, the block of code will execute one or more times.

The WHILE-DO-ENDDO Scobol construct implements a repetition with a test at the start of the code sequences; the code will be executed zero or more times.

The IF-THEN-OR-ENDIF implements a completely nestable if-then-else; the keyword OR replaces ELSE to permit standard Cobol if-then-elses as well.

The last refinement of our sample program will be to write alternate words backward. If words are to be written backward, they must be saved as they are read. Forward words will be read and written; backward words will be read, saved and then written.

(Continued on Page 22)

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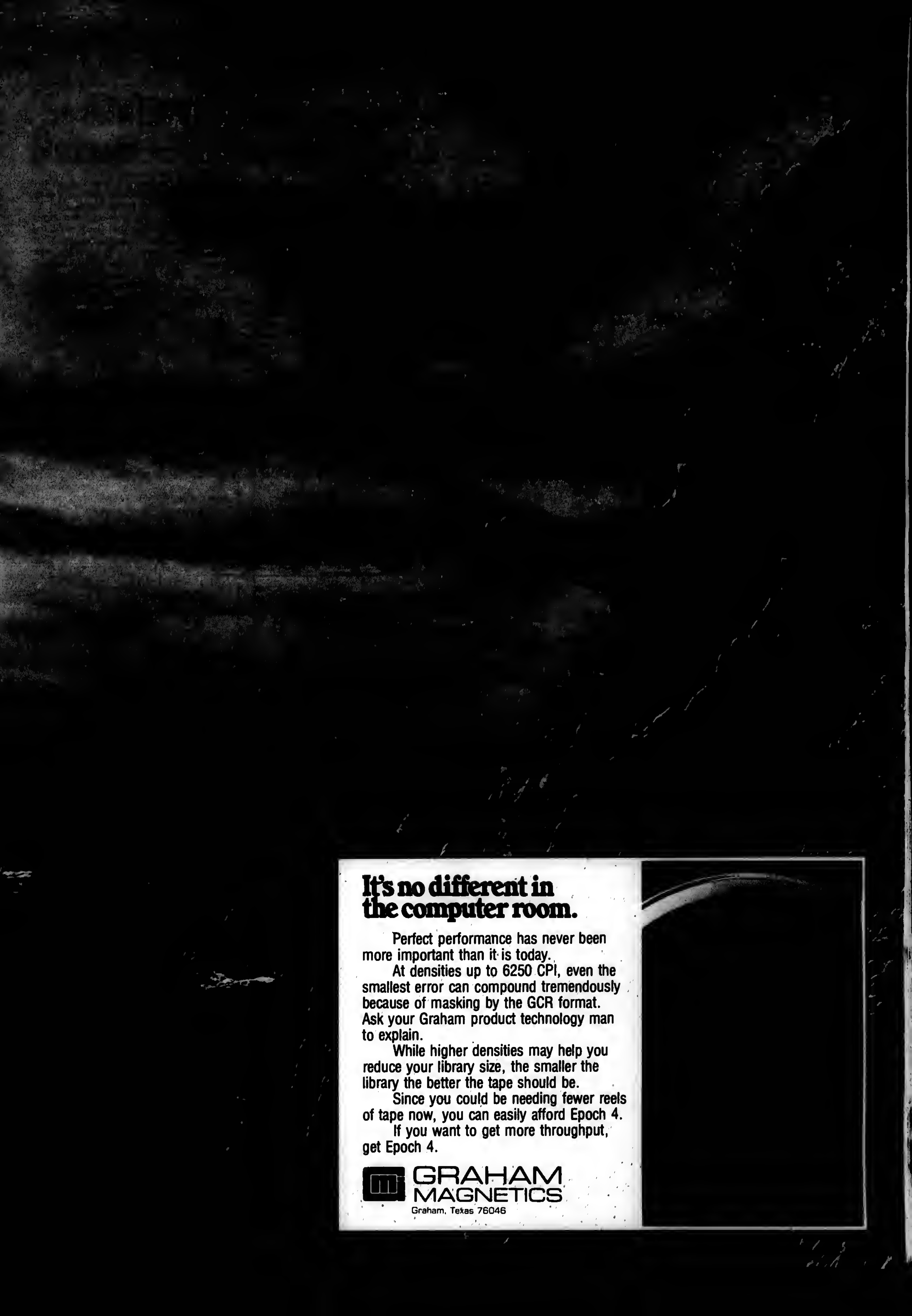

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Serious Problems Overlooked

Upgrade From IBM 3 to 370 Not as Easy as Claimed

By Frank Nestor

Special to Computerworld

The article headlined 'Upgrade from IBM 3 to 370 Called Easy' [CW, July 12] made interesting reading, but I suspect the upgrade was not as easy as represented. The speaker apparently failed to mention several possible problem areas.

RGP-II on the IBM 3, for example, allows an unordered load for an indexed file with just the index in a certain order and the file in a different sequence. A 370 does not, and any system using this will have to be rewritten.

What about Assembler on the 3? All DS and DC instructions work from right to left on it, but from left to right on a 370.

Nothing was mentioned about sorts. The 3's $DSORT allows add-out sorts, summary sorts with just needed fields output and tag-along sorts with or without the control fields output.

The 370 does not and, in addition, 3770 sort does not have card input unless an assembler exit program is written for it. Multiple input files cannot be sorted and merged, but must be in the correct sequence in order to be merged.

In IBM 3 $DSORT, up to eight input files can be sorted and merged; these can be mixed input, all in one pass. As most installations use a great number of sorts, a major revamping may be required to overcome this difference.

Another area where a 370 differs from a 3 is in utilities. There is no comparable utility in 370 for the $COPY of the 3. If one needs file-to-file copies on disk or tape, for example, 360 utilities must be obtained and modified for 3340 disks. The available utilities supplied will copy file-to-file, but only in the same location on the receiving pack.

The 3's $MAINT handles all library functions for all the libraries, but 370 library functions require separate utilities for each library and another for reorganizing.

What about teleprocessing? Many IBM 3 users, especially 3/15 users, are running CCP or RJE. Nearly all these users have their programs written in RPG-II.

The 370's Btam, MICS or CICS do not support RPG-II as a teleprocessing language. All teleprocessing applications written in RPG-II would have to be rewritten in Cobol or Assembler depending on which method of teleprocessing was selected on the 370.

What about conversion costs? An article, "Converting? Think Twice" in the July 1976 issue of *System/3 World*, covers this area very well.

In addition, nothing was said about the additional people who will be needed, to function as systems programmers.

There may be no great program changes necessary, but there may be a need for extreme system changes. In the words of that famous master of probability, Mr. Murphy, "Nothing is as easy as it looks."

Nestor, a former systems programmer at a 370 installation, is now employed as a systems analyst in a large 3/15 shop.

Use of Goal Shown By 'Silly Program'

(Continued from Page 20)

The words which are to be written backward will be saved in a 20-element table of characters. A variable WORD-LENGTH will be used to indicate the growing number of characters in te table, and a logical variable or "switch," FORWARD, will indicate whether the word is to be written forward or backward.

The "copy a word" routine is now replaced by:

```
NOTE - GOAL = COPY A WDRD.
NDTE - FORWARD CASE FIRST.
IF (FORWARO = TRUE) - THEN
  REPEAT
    CALL 'WRITECH' USING CHAR.
    CALL 'READCH' USING CHAR.
  UNTIL ((CHAR = SPACE) OR
  (CHAR = PERIOO))
OR
NDTE - AND NOW THE
BACKWARD CASE.
  NOTE - GOAL = SAVE
  CHARACTERS IN WDRO.
  MOVE ZERO TO WORD-LENGTH.
  REPEAT
    ADO 1 to WDRD-LENGTH.
    MOVE   CHAR   TD   WORD   (WORD-
    LENGTH).
    CALL 'READCH' USING CHAR.
  UNTIL ((CHAR = SPACE) OR
  (CHAR = PERIOD))
  NOTE - GOAL = WRITE IT
  BACKWARD.
  REPEAT
    CALL 'WRITECH' USING WORO
    (WORD-LENGTH).
    SUBTRACT 1 FROM WORD-LENGTH.
  UNTIL (WORD-LENGTH = ZERO)
ENDIF
```

Richard Cichelli is research manager of computer applications at American Newspaper Publishers Association/Research Institute in Easton, Pa.; Martha Cichelli is a partner in Software Consulting Services, Allentown, Pa.

DASD Ups Package Price

MILWAUKEE – The cost of the RPG II to ANS Cobol conversion package from DASD Corp. [CW, Feb. 19, 1975] will increase from $8,400 to $11,500 on Aug. 23.

DASD is at Suite No. 6, 8707 N. Port Washington Road, Milwaukee, Wis. 53217.

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With 'Total Solution' Service

Network Users Seen Free of Application Dependency

By Ronald A. Frank
Of the CW Staff

TORONTO – U.S. data communications users would like to eliminate the application dependency of their networks so they can have more flexibility – and they will achieve this with future "total solution" service offerings, according to AT&T's David O'Dwyer.

Each application now typically has its own network; these networks tend to be private line-centered with a limited area of interest, O'Dwyer told a session on network planning at the recent International Conference on Computer Communication (ICCC) here.

Users would like to more easily change or expand their nets with "durable systems standards" without completely replacing their installed components or revising their programs and procedures, O'Dwyer said.

The absence of a "total data communications system supplier" has forced users to design, develop, integrate, maintain and operate their own networks. Implementation of these nets has been complex, costly and concentrated with the large user; the needs of the small user have been only "minimally addressed," he said.

These opinions were based on a phone survey of data users conducted recently by AT&T and were meant to express the user's viewpoint, he added.

Over the next 10 years, five trends will evolve in data communications, he predicted. They are;

- More CPUs will be equipped with communications and, as a result, data communications will grow at a faster rate than data processing.
- Data communications functions will be distributed from the host to other system components such as remote control units.
- Dedicated (single-application) nets will merge into shared systems, reducing duplication and costs. This will allow smaller users to participate.
- Transaction-oriented, message-oriented and batch-oriented applications will appear as a "traffic continuum" to the network and the user will be able to "schedule traffic" in a more efficient manner than is possible today.
- Decreasing microprocessor costs will lead to multifunction devices such as data sets integrated into terminals and control units; multiplexers integrated into front ends and control units; and credit/debit terminals integrated into higher function point-of-sale terminals.

CW
At ICCC

Users want to achieve greater network flexibility without replacing terminals now in use and "without substantial changes to existing programs and procedures," O'Dwyer said.

Installed terminal devices, "if supported properly," could remain functional indefinitely, he told the session. In addition, users will satisfy their requirements by utilizing digital and satellite communications.

The user's ability to implement communications functions into data networks "will be further enhanced by the emergence of system architectures," he forecast. These will set standards for system performance and optimization and, in some cases, will be integrated with the DP function.

When this happens, he said, some "component suppliers will find it increasingly difficult to participate" because of requirements for both hardware and software compatibility and support.

A data communications offering that addresses user requirements could provide a total solution to these problems, he said.

Future of Packet -Switched Nets Remains Clouded

By Ronald A. Frank
Of the CW Staff

TORONTO – The Third International Conference on Computer Communication (ICCC) held here recently featured online demonstrations of five packet-switched networks.

France had three nets – RCP, Transpac and Cyclade. Canada showed Datapac, and Telenet represented the U.S.

Despite the apparent high visibility of these networks, however, only Telenet is an operating public network accessible to commercial users. Datapac will follow in a few months when it begins to connect users.

Beyond this, public availability of packet-switched data communications networks remains shrouded in a cloak of standards and political questions.

Most of the networks still support asynchronous terminals and – except for some research environments – the much heralded full-duplex synchronous transmission protocols remain untested.

Despite adoption of the X-25 network protocol by the Consultative Committee on International Telephone and Telegraph and its implementation by most nets, the problem of user synchronous terminal access remains unsettled.

Major terminal suppliers are all developing network architectures to tie users to their respective DP equipment. The willingness to interface these architectures to the packet-switched nets will be determined by vendor marketing decisions and carrier politics.

Analysis

But the carriers appear reluctant to give too many packet network control functions to their prospective customers. The real reason for X-25 with its virtual circuit approach may be related to this question; an alternative to the virtual circuit is the datagram, which is used internally for network transmission by almost all the packet carriers.

For U.S. users, the packet plans of AT&T may represent an opportunity for the easy interfacing of most terminals to what eventually will be a global packet network. AT&T plans a packet net in 1978 which reportedly will bring it into direct conflict with IBM's terminal/network strategy.

Most network users hesitate to make expensive system decisions until more answers are available. In the meantime, the packet-switching technology which originated in the experimental U.S. Arpa network waits for a full-fledged testing from the promised real world of the commercial public packet nets.

Standards Development Stressed

TORONTO – The importance of developing common standards for the emerging data communications networks was a strongly stressed theme at the recent International Conference on Computer Communication here.

Dr. E. Hummel, senior counsellor of the Consultative Committee on International Telephone and Telegraph (CCITT), said the X-25 protocol recommendation being implemented on several packet-switched networks is a good example of international standards cooperation.

The X-25 recommendation will come before the full CCITT this fall and, if it is approved, it will be possible for a data user to connect with the same technical and procedural standard to any packet-switched network, Hummel said.

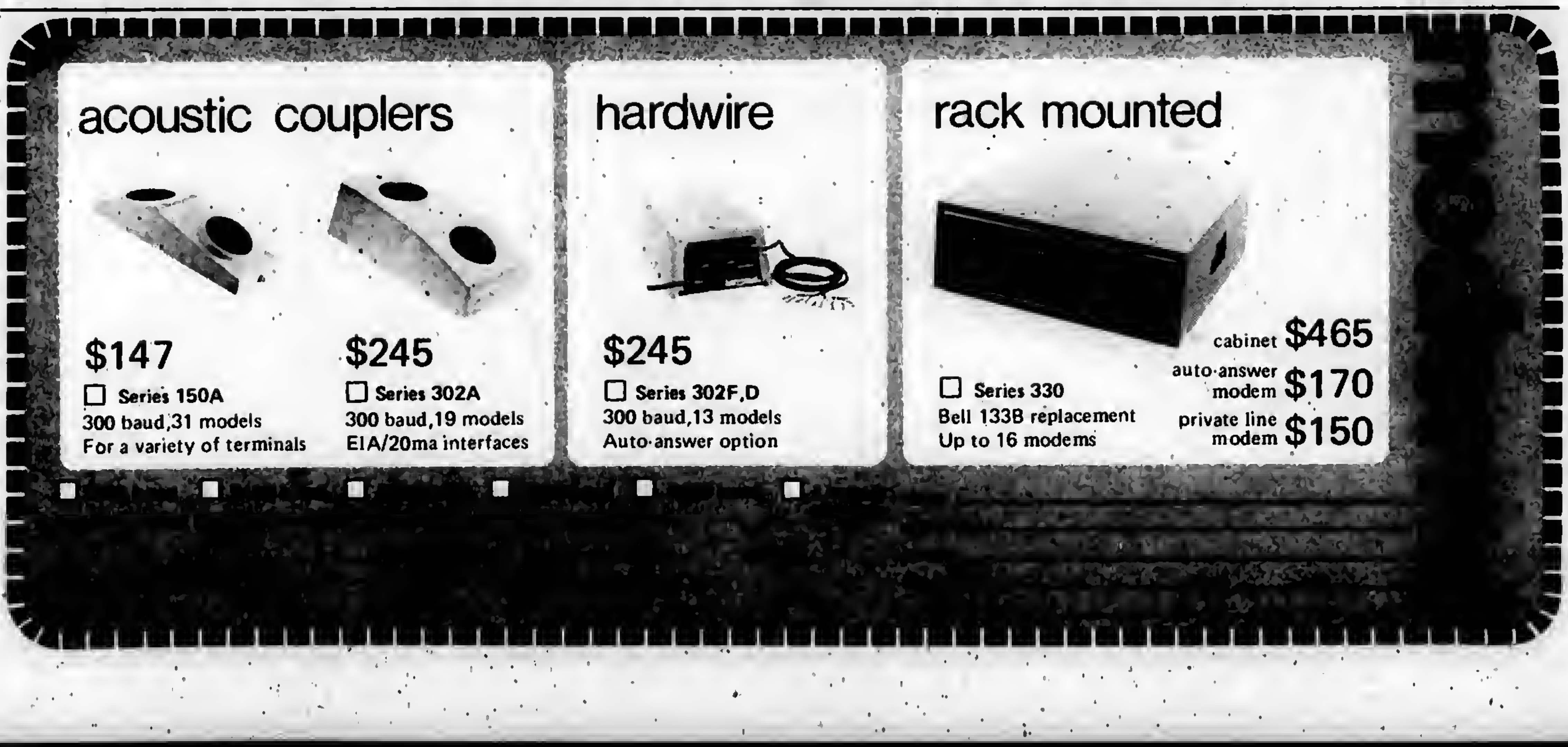
The proposed standard unifies network access for intelligent terminals and forms the basis for intelligent signaling procedures which Hummel described as the next urgent step in international standards efforts.

After that, a network access procedure for nonintelligent terminals will have to be developed, he said.

A further development will be the establishment of rules for interworking circuit-switched and packet-switched networks. This step finally will provide full interconnection of all data networks and result in a general worldwide data transmission network and service, Hummel said.

Standards now being adopted by the public packet-switched networks should also be utilized by private nets, according to Phil Kelly, head of data planning for the British Post Office.

If this happens, users of private nets would be able to go to public nets for backup facilities in much the same way private line users now go to dial-up lines when their primary systems malfunction.



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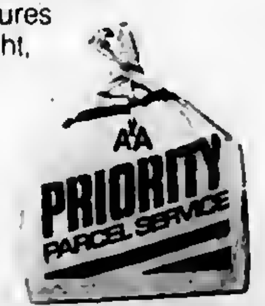

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Links to Installed CPUs

Wavetech Adds Audio Response System

SAN DIEGO – Wavetek Data Communications has expanded its audio response product line with the ADC-1500 audio response system.

The ADC-1500 was designed as a supplemental system for all mainframe and minicomputer users who desire to expand their computer capabilities to include audio response, Wavetek said.

It can communicate with any host device having 1,200 bit/sec asynchronous protocol capability over either full- or half-duplex lines. The interface to a host device is accomplished through a standard RS-232C connection, the company noted.

Remote operation between the audio system and the host can be accomplished using 202C- or 202D-type modems over voice-grade telephone lines, it said.

Data input to the unit is made by multifrequency tones at 10 char./sec with an initial capability of two to 32 I/O lines, Wavetek added.

The unit can transmit data at .5-sec intervals or at transmission speeds of 110-, 150- or 300 bit/sec. The system is also said to have remote diagnostic capability.

The audio response unit is compatible with transaction telephones, Bell System Touch-Tone telephones, Plantronics Corp. VU Set CRT terminals and Wavetek numeric terminals, the company added.

Prices for the basic ADC-1500 start at $25,000 with delivery in 120 days, the firm said from P.O. Box 651, San Diego, Calif. 92112.

Paradyne Line Sharing Device Provides 19.2 kBit/Sec Operation

LARGO, Fla. – The Paradyne Corp. Line-Sharing Device (LSD) is a data transmitter/receiver which is said to provide full-duplex data communications at speeds from 9,600 bit/sec to 19.2 kbit/sec over unconditioned voice-grade channels.

The LSD utilizes two independent voice-band channels operating at speeds of up to 9,600 bit/sec, the company said.

Standard features of the device include built-in diagnostics and an unattended self-monitoring capability that automatically switches down the speeds of the associated modems whenever channel degradation threatens data transmission capability, it noted.

System backup is provided via dial backup over each of the voice-grade lines, Paradyne added.

In addition, the unit has a "line-voting" capability which is said to allow simultaneous 9,600 bit/sec transmission over two different circuits and then automatically select the best circuit as the transmission route.

Built-in diagnostics of the LSD provide for network fault isolation and correction. Using an integrated test pattern generator and error detection, the device can insert a sequence in place of normal terminal data and monitor it, Paradyne said.

A network can be placed in either remote or local loopback from a single LSD, which allows the system to be tested from either end, it added.

The LSD is priced at $5,150 or $235/mo on a two-year lease and $165/mo on a three-year lease, the company said from 8550 Ulmerton Road, Largo, Fla. 33540.

Dynatech Switch Changes Modems

ALEXANDRIA, Va. – Dynatech Laboratories, Inc. has added a modem substitution switch system to its line of communications control equipment.

The switcher allows an operator at a remote location to substitute a spare modem for any one of up to 64 on-line modems by pressing a button, the company said.

An interlock feature to prevent accidental switching is incorporated in the system, as is an LED display to show system status, a spokesman added.

The system is comprised of two elements, a control panel and the switcher. Each control panel handles up to eight switchers and each switcher handles eight on-line modems plus one spare modem, the company said.

Capacity can reportedly be extended from a basic eight-modem system and one spare to a 64-modem, eight-spare system. In addition, modem speeds may be intermixed in groups of eight, it added.

The price of a basic substitution switch for eight modems and the spare is $1,550; the control panel ranges in price from $525 to $700 depending on the number of switches, according to the spokesman.

The company is located at 900 Slaters Lane, Alexandria, Va. 22134.

Tele-Dynamics Limited-Range Unit Works With Unloaded Private Lines

FORT WASHINGTON, Pa. – Tele-Dynamics has a limited-distance modem which reportedly permits error-free communications over unloaded private cable systems or telephone company-supplied local exchange loops.

The Model 7300 provides full- or half-duplex operation over four-wire lines or simplex operation over two-wire lines, at 1,800-, 2,400-, 3,600-, 4,800- and 9,600 bit/sec and 14.4- and 19.2 kbit/sec speeds, the company said.

A phase-delay system of data encoding is featured by the device, which generates a narrower transmitted spectrum than other two-level techniques resulting in lower transmission frequencies and allowing higher transmit levels, according to the company.

A compromise transversal equalizer offsets transmission effects of the cable and further extends the range for private line metallic circuits; at an 1,800 bit/sec data rate, a range of 100,000 feet was obtained, Tele-Dynamics said.

The Model 7300 modem sells for $695, with quantity discounts available, Tele-Dynamics said from 525 Virginia Drive, Fort Washington, Pa. 19034.

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On-Line Units Speed Austrian Insurance Services

GRAZ, Austria – The installation of on-line terminals has reportedly enabled an Austrian province to expedite health insurance services to 750,000 of its residents.

In common with most European countries, Austria has a comprehensive system of social security which embraces the whole range of health insurance, retirement pensions and unemployment compensation.

The Steiermarkische Gebietskrankenkasse (STMK GKK), headquarted here in Graz, capital of the province of Styria, is a regional health organization which has been a leader in adopting the most efficient administrative methods, a STMK GKK spokesman said.

Also located here is the largest hospital in the province, Landeskrankenhaus, with a 4,000-bed capacity. Elsewhere in Styria are 18 other hospitals with a total of 13,000 beds.

The STMK GKK plan covers most of Styria's workers and their dependents, pensioners and the war injured. Insurance plans operated by other organizations cover the remaining half of the province's population.

In 1973, the STMK GKK acquired a Univac solid-state computer which was used to keep records of the contributions paid into the health plan by employers on behalf of their workers. The use of this computer resulted in a reduction of 43 people in the clerical staff, the spokesman noted.

Dr. Hans Doblda, head of the DP department for the STMK GKK, said the experience in effecting economies with this computer led the staff to investigate further possibilities of becoming more efficient.

"We were not only looking for economies in operating costs, but also to give much better service to the persons insured by our organization," Dobida noted.

Under the old system, the insured person brought a certificate from his physician or employer stating he was unable to work to the regional office. The clerk in the office completed this certificate, which was then sent through the post office to the headquarters here, Dobida explained.

Because the capacity and capabilities of the computer were not enough to handle the new concept, it was obvious a larger system capable of real-time operation was required, Dobida said.

A larger Univac 1106 CPU capable of real-time operation was installed in the STMK GKK DP center here in April 1972. Since the transfer of the batch operating programs to the 1106, the earlier computer is no longer used.

The 1106 system has a main memory of 262,000 words. The peripheral equipment includes six magnetic tape units, six magnetic disk units, two high-speed memory drums, a high-speed printer and two Univac 9200 computers for I/O operations with the larger unit.

The DP center is operated by a staff of 45 persons consisting of computer and keypunch operators, programmers and systems analysts working under the direction of Manfred Strohmayer, the DP manager.

Previously, information on insurance payments by employers was sent by the companies through the post office to STMK GKK, where it was punched on cards and entered into the system. Today, this information is entered into the system via Uniscope 100 display terminals in real-time mode, Strohmayer said.

The central government's Department of Social Administration in Vienna keeps a data bank with records of health insurances administered by all of the provinces so that pensions can be calculated and various statistics prepared.

Previously, the records from STMK GKK were sent to Vienna on a magnetic tape. The system has been improved to allow the information to be transmitted directly to the department's computer via a data communications line from Graz.

Terminal Transactions

Twenty-five terminals in various administrative offices in the headquarters here are connected on-line to the 1106 system. Several of these terminals are installed at the counters where the insured apply for benefits.

The clerk at the counter, using a visual display, calls up the person's records in the computer files and receives a response on the screen of the device within two to three seconds.

Four other terminals with printers attached are installed in other offices in the headquarters to obtain information as required from the CPU.

A further enlargement of the real-time system occurred in 1975 when the computer communications network was extended to 20 branch offices.

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Bits & Pieces

NBS Publishes Guidelines For OCR Forms Designers

WASHINGTON, D.C. – The National Bureau of Standards (NBS) has issued new guidelines for optical character recognition (OCR) forms.

Federal Information Processing Standards (Fips) PUB 40 describes OCR requirements for forms and presents suggestions for efficient and economical form design.

The publication inclues a checklist for forms definition, design, verification and specification, as well as a description of forms layout papers, rules and representative reflective inks, NBS said.

Fips PUB 40 is priced at $1.80 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Printers Work With Minis, CRTs

COSTA MESA, Calif. – Tokyo Juki Industrial Co. has introduced the 5700 series of dot matrix serial printers.

The double-head Model 5703 prints 75 line/min at 132 char./line, while the single-head Model 5701 prints 50 line/min.

The printers were designed to interface with minicomputers, CRTs and data communication terminals.

The Model 7503 is priced at $2,400 and the 7501 at $1,900 from the firm at 3186-G Airway Ave., Costa Mesa, Calif. 92626.

BST Disk Drive Fits IBM 3/10

SANTA ANA, Calif. – Business Systems Technology, Inc. (BST) has introduced a plug-compatible disk storage drive for IBM 3/10 computers.

The BST/458, a single-disk drive, is expandable to four drives and adds 20.4M-bytes of "removable" disk storage to the 3/10, according to the firm.

Average access time for the BST/458 is said to be 35 msec; with a data transfer rate of 312 kbyte/sec.

BST is offering the unit on a month-to-month, one-, two- or three-year lease or for purchase. The BST/458 costs $600/mo on the month-to-month lease.

BST is at 3015 Daimler St., Santa Ana, Calif. 92705.

Adage Cuts GP/400 Prices

BOSTON – Adage, Inc. has announced price reductions for the GP/400 graphics peripheral product line.

The average price reduction for a typical GP/400 three-dimensional configuration is 10% to 15%, Adage said.

Further information is available from the firm at 1079 Commonwealth Ave., Boston, Mass. 02215.

Because 3350s Not Available

User Puts STC Super Disks on 360/65

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – "IBM has left its 360 and 370 users to sputter along when it comes to disks; it wouldn't do anything to give the 3350 to 360 users," according to Lee Johnson, president of Computer Network Corp. (Comnet).

The national service bureau's reaction to the neglect it felt it was suffering at the hands of IBM was to install Storage Technology Corp.'s (STC) Super Disks – the first Super Disk installation on a 370/65.

"While this had never been done before, it's a very efficient method," Johnson said.

The first STC 8000 control unit and STC 8800 disk drive were installed at Comnet last October and a second disk was installed in February.

Comnet had been using IBM 3300 disk drives and wanted the Super Disks to augment its storage. It now has 7G bytes of storage; another 6G bytes are on order.

The company was "not at all hesitant about being the first user to implement the disks on a 360/65," Johnson said. "We've been doing business with STC since 1971 and have always been satisfied with it."

Although STC said the Super Disk's access time is 30 msec, Comnet found the use of monitoring devices reduced it to between 21- and 23 msec, Johnson said. The company makes approximately 500,000 inquiries hourly, he added.

There were no installation problems, according to Johnson. STC engineers worked with Comnet throughout the implementation to smooth out any problems that might have occurred, but there were "absolutely none."

Although some of Comnet's marketing people were nervous about the move to Super Disks, the company put its heaviest workload on them "from Day One," Johnson said, so it would know how the disks would hold up under the toughest of conditions.

The two disks run 720 hours per month each, and they have been operating for 10,180 hours with only one failure, Johnson said.

That failure occurred in March when an idler bearing started slipping; it took 13 minutes for STC to fix the problem, he said.

The only complaint Johnson had with the Super Disks at first is that they are covered with metal so there are no visual indications of drive activity, as there are on the IBM 3300.

STC corrected this problem by installing light display consoles on the drives to show which of the logical spindles is being addressed and how often, he said.

Fish Processor Finds Microfilm Saves File Space, Access Time

GLOUCESTER, Mass. – By converting its accounting and inventory files to microfilm, a processor of frozen fish products here said it reduced file space by 80% and cut retrieval time from an average of four minutes to less than a minute.

The company "had nearly a million documents in the paper files consisting of accounts payable and receivable invoices, check duplicates, inventory transaction documents, purchase orders and requisitions," according to Robert E. Jennings, systems controller of the Gorton Group.

"And," he added, "we were adding about half a million documents a year to the files."

A Kodak Miracode II microfilmer was installed to permit insertion of a machine-readable binary code between film images to identify each document. When a code is keyed in on the controller of the Miracode II retrieval terminal, the terminal locates the desired document image and displays it on the screen.

One adaptation of the filing system was made to cross-index the credit and invoice files. "With the paper files, if we had a pricing error on an invoice and a credit was issued, someone would pull the invoice and note on it the credit and the number of the credit slip," Jennings said.

"You can't write on microfilm, however, so we added another three digits to the coding of the credit files to cross-index the invoice the credit was issued against. Now, if we need to know that a credit was issued, we can use the retrieval terminal to search the film, locate it and reference the incoice," he explained.

Before switching the company's files to microfilm, Jennings spent a year conducting a study to make sure the conversion would work. One aspect the study focused oh was filming efficiency.

The coding is entered by the operator through a controller similar to a 10-key calculator pad at the time documents are filmed. On most paperwork, the coding information was located in several places on the document, forcing the operator to scan the entire sheet while coding.

Coding is now all in one place "speeding operations considerably," Jennings said.

During the year-long conversion study, interviews were conducted with everyone who used the paper files to get their suggestions and make them feel a part of the new system.

The origional plan called for file clerks to train others to use the retrieval terminal, but people started using the microfilm files immediately, Jennings said.

By using the terminal in a "walk up" environment, retrieval time for each record has been trimmed to about 30 seconds, he added.

In the Used Market – Part 3

Three Avenues Open to Sellers

By Sonny Monosson
Special to Computerworld

Having made a decision to offer his used equipment for sale, the user has essentially three avenues open to him:

- To establish dealer contacts.
- To establish one or more brokerage contacts.
- To attempt direct sale of the equipment himself.

As a market developed for used computers, capital became increasingly available for dealers, whose numbers have grown rapidly over the past five years. The used computer dealer purchases equipment for his own inventory or account.

A dealer's business activity is keyed to the margional differences between prices at which he may sell equipment and his cost of acquisition, as well as the length of time in inventory. His operating expenses are mainly involved with keeping goods in inventory for resale purposes.

The great advantage to the seller of used equipment is the dealer's commitment to pay for this equipment on delivery – albeit at what is otherwise referred to as "wholesale" prices. The dealer, as any buyer, must be notified of exact details of the equipment offered for sale – equipment model and type, options, features and description, for example.

These details are frequently supplied by a photocopy of original purchase invoice and invoices for maintenance services. Additional information concerning the configuration and its history are also pertinent to the transaction. The invoice

(Continued on Page 28)

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Three Alternatives Open to Sellers of Used Systems

(Continued from Page 27)

itself is often helpful for descriptive purposes.

Once the seller and the buyer have come to a general agreement to purchase, the dealer is normally prepared to work out the details of title transfer with the seller. Should the user encounter a general resistence to buy on the part of known dealers, he may take this as a mild warning that the market for his machine is presently sluggish.

The Broker Commitment

Having approached the dealers or bypassed them entirely, the seller may contact any number of groups operating as computer equipment brokers. The broker works for a fee, payable generally by the seller and agreed upon in advance of any marketing activity.

The fees requested generally bear some relation to the anticipated effort required to place equipment with an end user. The role of the broker is to attempt to identify prospective purchasers and to assist in negotiating final terms.

Brokers' fees are currently quite variable, ranging from 2% up to 50% of the selling price.

In some cases, a broker will quote an alternative schedule of base percentage at one rate plus an incentive fee for getting a higher selling price. Also quoted are guaranteed fees plus a commission override, with the base fee generally going toward the payment of direct msrket expenses.

These are among the many variations the seller may encounter in working with brokers, presented here in roughly the order of increased commitment on the part of the broker as the selling agent.

The seller may also grant "exclusive" agent rights to a broker for a period of time, ususally 60 to 180 days – another mechanism tending to increase the broker's commitment.

Given exclusive control over a particular piece of equipment, the broker or dealer/broker is free to advertise and work with other brokers. This tends to increase the level of sale activity for the unit in question.

At the other extreme, where no such control exists, the broker is considerably hamstrung in his ability to negotiate price, for he may be competing with other brokers on the same unit. He occasionally finds the unit he is trying to sell is being offered to him by another broker.

Many dealers (and leasing companies as well) utilize these same equipment brokers as aids to their own equipment distribution. In such cases, the commissions paid by dealers are normally considerably lower, for the dealership offers the broker a continuing source of equipment and a continuing relationship.

Several known dealers also serve as brokers, particularly for equipment they are not interested in handling for their own accounts.

Direct Sale

Still another method of equipment disposal is direct sale. The first step is direct advertising in commercial newspapers, computer industry, journals and/or specific applications publications (for example, banking magazines and journals).

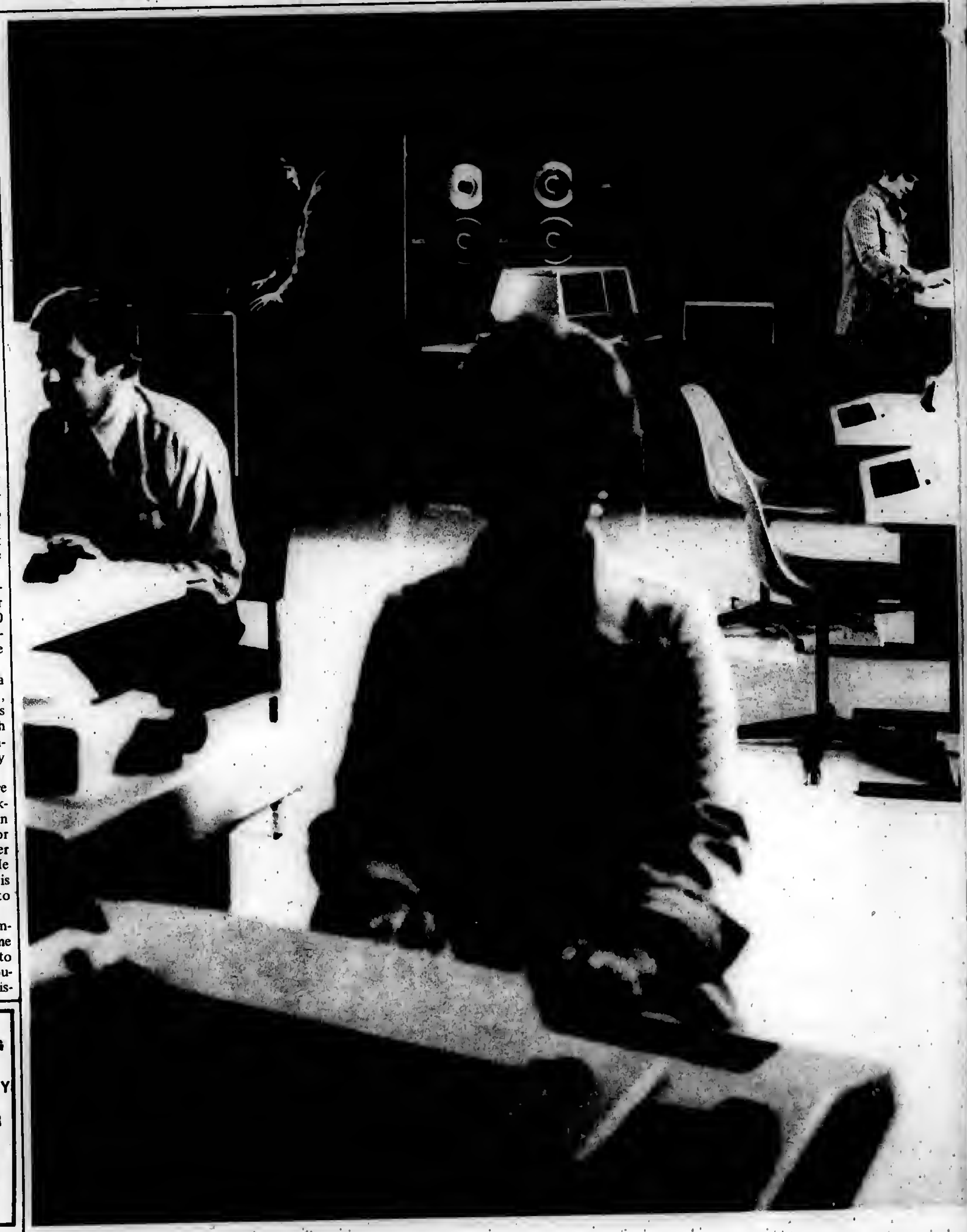
The seller will find substantial competition on such pages, which themselves serve as a measure of activity in used machines. For example, a recent issue of *Computerworld*, in a special classified section on equipment wanted or for sale, carried 65 advertisements for a wide variety of equipment ranging from a Burroughs ledger card system to an IBM 370/165.

The preponderance of IBM equipment represents actual market presence, combined with user demand. Equipment for which there is low demand or little observed used trading generally doesn't appear in dealers' advertisements, but instead in ads placed by private owners.

Of our sample of 65 advertisements, only four were clearly identified as individual buyers or sellers. For the seller or buyer of equipment with few installations, mass advertising will have little effectiveness.

For older equipment, the seller can approach the appropriate user group, if it still exists. When attempting to dispose of very old equipment, the seller should contact the original manufacturer, which may want to repurchase the equipment for replacements parts or which may be able to recommend potential buyers.

Monosson is a past president and now chairman of the Computer Dealers Association and is president of American Used Computer Corp.



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In a Sea of Options

Scrutiny Key to Selection of Key-to-Disk Equipment

By Teri Morehart

Special to Computerworld

Users who are switching from keypunch to modern key-to-disk equipment are finding the process more complex than they anticipated.

It's not the basic decision; the productivity increases of key-to-disk over keypunch are clear-cut and easy to translate into return-on-investment. The problem is which key-to-disk system to select – or, more precisely, which options should be included.

And those options are indeed myriad. Key-to-disk systems today range from what are called "plain vanilla" systems to what are essentially file management/processing systems with full sets of peripherals.

The pricing structures are equally complex. A feature which one vendor prices as an option may well be included in another vendor's base lease price.

Before even considering bells and whistles, a user should look at that plain vanilla system and see just how operationally sound it is.

The answers to a few basic questions should reveal exactly how convenient – and productive – the system will be. Samples are:

- How many keys must be operated to delete a record?
- How easy is it to make a correction?
- Does the operator have to get involved in batch balancing?

Then the user should take a close look at the hardware specifications. What really is offered?

Consider disk capacity, for example. Most vendors offer a 2.4M-char. disk and advertise 25,000 80-char. record storage. With typical requirements for system software, format libraries, edit routines and the like, a 2.4M-char. disk, in most cases, stores only about 18,000 data records.

It's best to know that fact at the outset because adding disk storage later can be expensive with some systems.

Memory allocation is another fuzzy area. If a user tries to operate a system on the marginal amount of core offered in some keypunch replacement systems, he may well regret it.

If insufficient core is provided, CRT screen response will be slowed with a corresponding reduction in operator productivity. Such a condition could also slow a batch transfer to an unacceptable rate.

Finally, a user should demand certain fail-safe features in any system. With cold recovery provisions, for example, a power failure is a relatively minor inconvenience. All data on the disk can be recovered and a hard-copy report covering every batch in the system is printed.

Bells and Whistles

While sound system provisions such as these are important to any system, the bells and whistles may or may not be important.

One nice sounding feature is dynamic disk allocation. Basically, it allocates a disk on a space-available basis. Initial disk entries are, therefore, tightly packed.

It sounds very useful, until a user finds that this process may require disk repacking.

Another widely touted feature is foreground editing, and here the individual application will dictate whether it is needed.

Foreground editing is extremely important for such applications as inventory control, where an item number error should be caught immediately.

For general applications, however, there are some questions whether it is worth the cost. Not only does foreground editing eat up core, it sharply cuts keying productivity.

Sort/merge is another widely offered option, consisting of software in the key-to-disk system which sequences the keyed data in a form the mainframe computer can accept directly.

For users looking for ways to offload their mainframes, sort/merge is a highly advantageous option. For users not currently using the full power of their computers, sort/merge probably isn't needed. However, make sure sort/merge can be added at a later date.

Printers are available in a wide range of speeds, and printers as fast as 600 line/min can be added to a key-to-disk system. Normally, however, this speed represents a nicety that is rarely needed. We find few applications where a little 10 char./sec teletypewriter doesn't suffice.

A user shouldn't carry this line of reasoning too far, however, and elect not to have any printing capability at all.

Morehart is manager of special programs at Computer Machinery Corp.

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Mini Bits

CSP Links Array Processor To HP 2100s Under RTE-3

BURLINGTON, Mass. – Hewlett-Packard Co. (HP) 2100 series minicomputers operating under the RTE-3 real-time executive can now be linked to the Macro Arithmetic Processor (MAP) array processor from CSP, Inc.

With the MAP, the HP systems can handle up to 15 million rounded 32-bit floating-point operation/sec and a wide range of algorithms, CSP said.

The MAP models with hardware and software interfacing to HP 2100 minis start at $8,400, CSP said from 209 Middlesex Tnpk., Burlington, Mass. 01803.

ISI Has Voice Response System

ANN ARBOR, Mich. – The Digitally Activated Voice Information Device (David) from Interface Systems, Inc. (ISI) is a voice response system that includes software and hardware interfaces for the Digital Equipment Corp. PDP-8 and PDP-11 and the Data General (DG) Nova.

The microprocessor-driven unit can be used at local or remote sites for voice response distributed-networks, ISI said.

The voice is generated by a digitally driven, solid-state speech synthesizer.

David, which can be field-expanded from one to 16 lines for direct connection to AT&T's Data Access Arrangment, ranges in price from $6,750 to $47,500 depending on the configuration, the vendor added from 462 Jackson Plaza, Ann Arbor, Mich. 48103.

8K, 16K Add-Ons Fit LSI-11

HAWTHORNE, Calif. – A series of semiconductor memory modules for Digital Equipment Corp.'s LSI-11 minicomputer has been announced by Memory Systems, Inc.

The Mastermind series consists of two models, the 2000-8 with 8K 16-bit words and the 2000-16 with 16K 16-bit words.

Each has a 500 nsec access time with 800 nsec cycle time, Memory Systems said.

The Model 2000-8 is priced at $875 and the Model 2000-16 costs $1,450, the vendor added from 3341 W. El Segundo Blvd., Hawthorne, Calif. 90250.

National Semi Adds 8080 Type

SANTA CLARA, Calif. – National Semiconductor Corp. now has an Intel 8080A-type, general-purpose 8-bit micro called the INS8080A.

It is a direct pin-for-pin replacement for the Intel 8080A, the firm said.

The CPU costs $19.95 in lots of 100, National Semi said from 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

'Super Heavies' Found in Rock

Mini Helps Discover Natural Elements

By Esther Surden
Of the CW Staff

FORT LAUDERDALE, Fla. – Evidence leading to the discovery of three more natural elements was found with the help of a computational minicomputer, according to the team of six physicists and one scientific programmer who announced the find here.

The results of the experiments, announced in June, have yet to be confirmed by other laboratories, but a rash of research activity is already taking place, Dr. William Nelson said. Nelson is a research physicist and one of the team members.

If the experiments are verified, the elements will be the first discovered in 51 years and the first natural elements ever discovered in this country, he noted.

Super Heavies

The elements are classified as "super heavies" and have atomic numbers of 116, 124 and 126 respectively, Nelson said.

The researchers were working in the laboratory facilities of Florida State University with a variety of specialized equipment. The nucleus of the lab is a giant Van de Graaff 20 million electron volt "proton tandem accelerator" from High Voltage Engineering in Burlington, Mass., which performed the proton bombardment necessary for the experiments.

The rest of the equipment includes a Univac EMR 6130 32K minicomputer on-line to the accelerator and a 64K Harris Corp. Slash 3 computational system linked to the 6130 by a Camac interface.

The grant for the research came from the National Science Foundation and the Environmental Protection Agency.

Started With a Rock

The research began when a rock from Africa generated the interest of Robert Gentry of Oak Ridge National Laboratories in the "giant halos" found in thy rock. The rock was made of mica, which can be peeled into planes, and the researcher noticed rocks of a different kind embedded in the mica.

Around these "inclusions" a spherical glow, or "halo," could be seen under a microscope, indicating alpha particles. But some of the halos were larger than others, and that meant there was some difference in the particles, Nelson said.

"All efforts to find such a difference were not successful until we tried the proton bombardment, which allows us to look at the elemental composition. We did find a difference. We saw some lines, and one way to explain them was through super heavy elements," Nelson explained.

Dr. William Nelson demonstrates the use of the scope and light pen input devices to the minicomputer.

Gentry brought his theory to Dr. Thomas Cahill of the University of California at Davis, who was scheduled to go to Florida State University to do some air pollution studies. The equipment needed was already there.

During the runs, the EMR 6130 minicomputer collected the data from the five-minute test and converted it from analog to digital and then stored it on magnetic tape.

This tape was then run into the Slash 3, where absorption corrections were performed and background subtraction and various other statistical techniques were applied.

When this was completed, the raw data was available in absolute concentrations for each element and output in the form of graphs, tabular results, and magnetic tape for later analysis.

The program, designed by scientific programmer Henry Kaufmann, is a Fortran nonlinear least-squares fitting program that uses 48K words of memory. Using a library of peaks and nonlinear parameters, it fits a very large-scale model of what is happening to the data.

While it presently only fits 30 elements, Kaufmann is revising it to accept all of the super heavies, he said.

In addition to the pure scientific value

(Continued on Page 32)

On-Line System Proves Solution For Firm Stocking 12,000 Parts

MINNEAPOLIS – "With 12,000 separate parts in stock ready for some 37,000 possible assembly combinations, our problem is not so much production control as it is finding accurate means of regulating inventory," according to Ralph Lehner, DP manager for Raygo, Inc. here.

A small-scale system seems to be the solution, he added.

The company produces earth, asphalt and sanitary landfill compactors as well as earth levelers and soil stabilizers for the heavy construction industry.

For some years, inventory was managed with support from a DP service bureau which produced crib pick lists on established production schedules. Later, weekly reports on stock and materials on hand were added to the pick lists and monthly requirement reports.

"With our growth, the cost of the service bureau was approaching the break-even point. We ultimately came to feel there was an overall lack of value received in terms of the reports we were getting and the increasing demands of our production," Lehner said.

"Since Raygo is primarily an assembly operation, its main problem is inventory, not production control," he explained.

Prior to choosing a small-scale system for its inventory control application, Raygo went through a thorough screening process. Most of the minicomputer manufacturers such as Digital Equipment Corp. and Data General Corp. were removed from consideration because they couldn't offer the necessary applications software, Lehner said.

The field narrowed to Honeywell, IBM, Singer and NCR. NCR received the nod because it offered the most software for the price, he indicated.

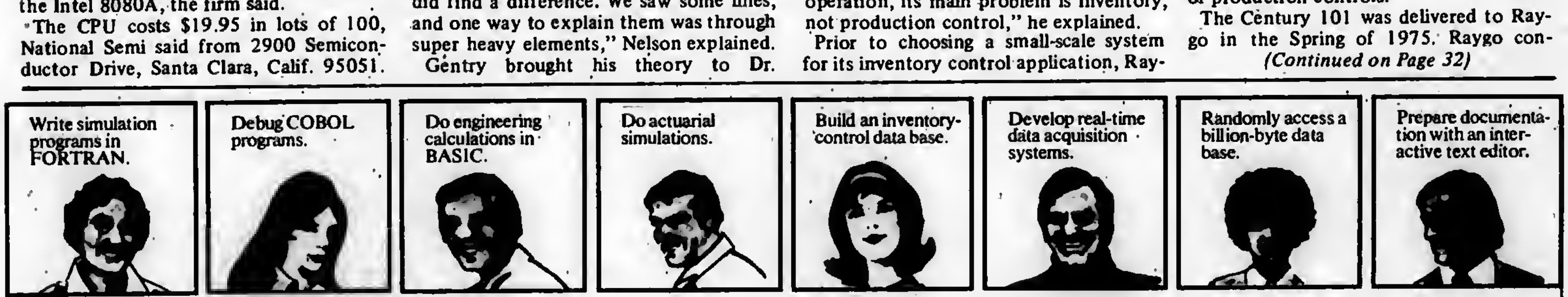
To support its inventory management functions, Raygo is now using an NCR Century 101 providing on-line service to terminals located in the plant.

The system, set up under Lehner's direction, enters each newly received stock item into inspection status in the computer files when its arrival is noted on a terminal at the receiving docks. The system continues to keep track of the item's movement from the time it is accepted into inventory until it is put into production.

The exact status and location of a single item or any stock of items may be reported to anyone concerned with inventory or production controls.

The Century 101 was delivered to Raygo in the Spring of 1975. Raygo con-

(Continued on Page 32)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Sweda Gives Roytron Serial Compatibility

PINE BROOK, N.J. – Sweda International has introduced the Model 1560-S, a Roytron paper tape reader/punch with serial interface compatibility, according to a spokesman.

The unit can be connected to the serial port of most minicomputers and microprocessors and can also sit between a terminal device and its associated modem, the spokesman noted.

The punch is designed to operate at speeds up to 60 char./sec, perforating all varieties of normally used commercial tape.

The reader utilizes a stepping motor tape transport, he added.

Internal switches allow for reader data rates of 50- to 2,400 bit/sec. A quietized housing produces a low noise level, he said.

The unit costs $2,195 from Sweda at 34 Maple Ave., Pine Brook, N.J. 07058.

Ball Announces Disk Subsystem

SUNNYVALE, Calif. – Ball Computer Products, Inc. has a disk subsystem for Data General Corp. minicomputers, according to the firm.

The Model 250A subsystem incorporates a Ball BD-50 disk, an IBM 3330-type disk pack offering 50M bytes of on-line capacity and a controller capable of supporting up to four drives.

The BD-50 is designed to support file management techniques in real-time, multiterminal and batch systems. It incorporates a 3330-type spindle interface.

The subsystem costs $10,600 with one BD-50 disk drive, controller, disk pack, rack slides, terminators and connecting cables, Ball said from 860 E. Arques Ave., Sunnyvale, Calif. 94086.

Firm Moves to In-Houses System To Keep Track of 12,000 Parts

(Continued from Page 31)

verted the files from the previous service bureau operation for in-plant use, then built its own on-line programs.

The system consists of a central processor with 48,000 characters of memory, a 60M-character disk drive and a backup drive with 10M characters.

A 450 to 900 line/min printer provides the printed reports and a series of CRTs provide direct on-line communications to the system.

Business forecasts are generated with input from sales. These forecasts are translated by computer programs into production schedules, from which the subsequent material issue systems are based. Each production schedule has a two-year life, although in practice a somewhat shorter term is normal, Lehner said.

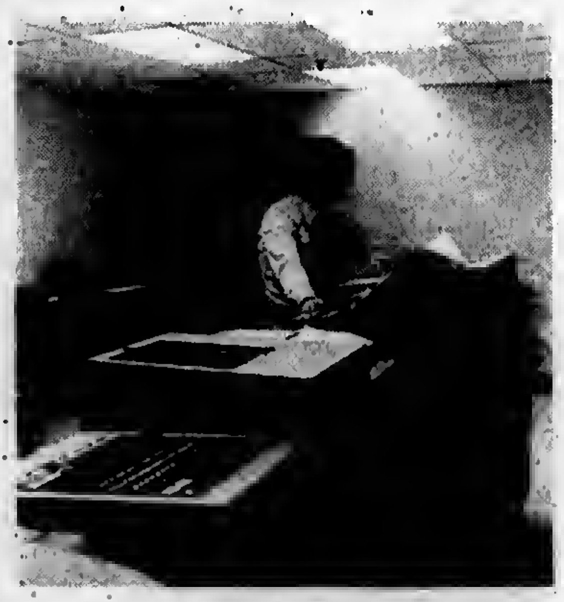
Labor availability data is also loaded into the system. From this input, a monthly overview of production scheduling is generated.

On-Line Purchasing

An on-line purchasing program is another feature of the Raygo system. A requirements planning module derives requirements from vendors, then places the purchase order to cover production needs.

In addition to the automated system, there is also a CRT in the purchasing department which provides a direct means of keying in and producing purchase orders, Lehner said.

When an item is received in stock, its part number and quantity are keyed into the CRT located at the receiving dock. The item then appears in an inspection status within the computer files and this information is available to all appropriate personnel through any CRT terminal.



The system at Raygo supports inventory management and purchasing applications.

After inspection, the inspector enters all valid parts on the CRT and moves the stock to a stores status. As it is stocked, the crib personnel again update the computer files by inputting the crib location into a CRT.

Prior to assembly, the items to be issued (as reported on the production schedules) are printed out on a picking list and sorted in location sequence by the system, which minimizes the picking time.

As a final step, the fact that an item has been taken from stock is entered into a CRT and current stock status is updated.

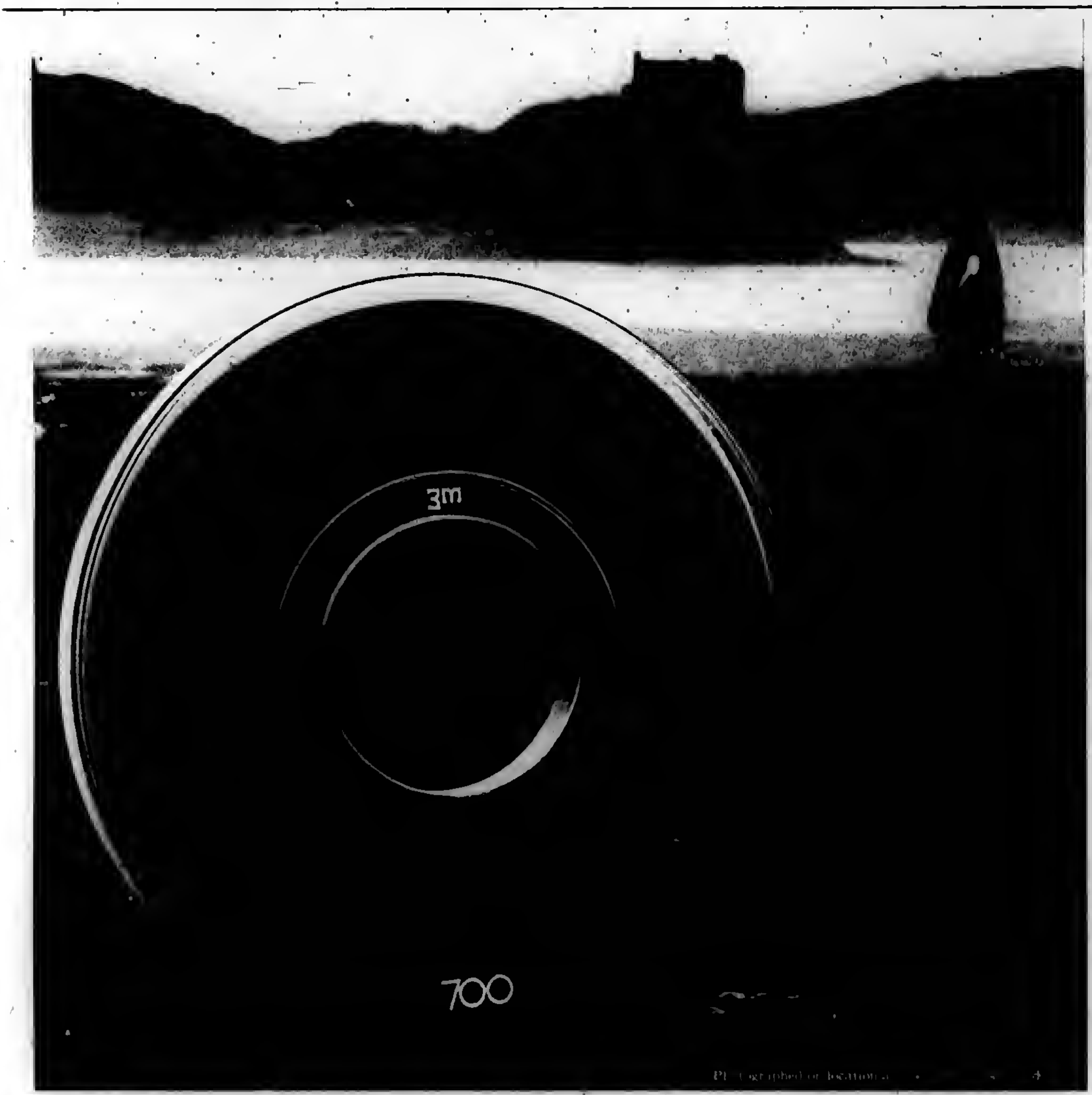
In addition to the information available on the CRTs, there are a number of management reports generated from the file data. One is a Material Requirement Package which details all materials needed each month. This printout shows items that will be in short supply and allows contract trackage of items needed in production forecasts.

Mini Aids Discovery Of 'Super Heavies'

(Continued from Page 31)

of the experiments, there are expected to be many beneficial spin-offs. Chief among these is the expectation that the discovered elements will open new areas of study in medicine and biology, with the elements possibly being used to power sophisticated pacemakers.

The Slash 3 complement at Florida State University consists of the CPU with 65K words of core memory, a scientific arithmetic unit, a 28M-byte disk, 600 line/min printer, operator's console and both a 7-track and a 9-track 45 in./sec tape deck. Rounding out the peripherals are a scope and light pen and a Versatec plotter/printer.



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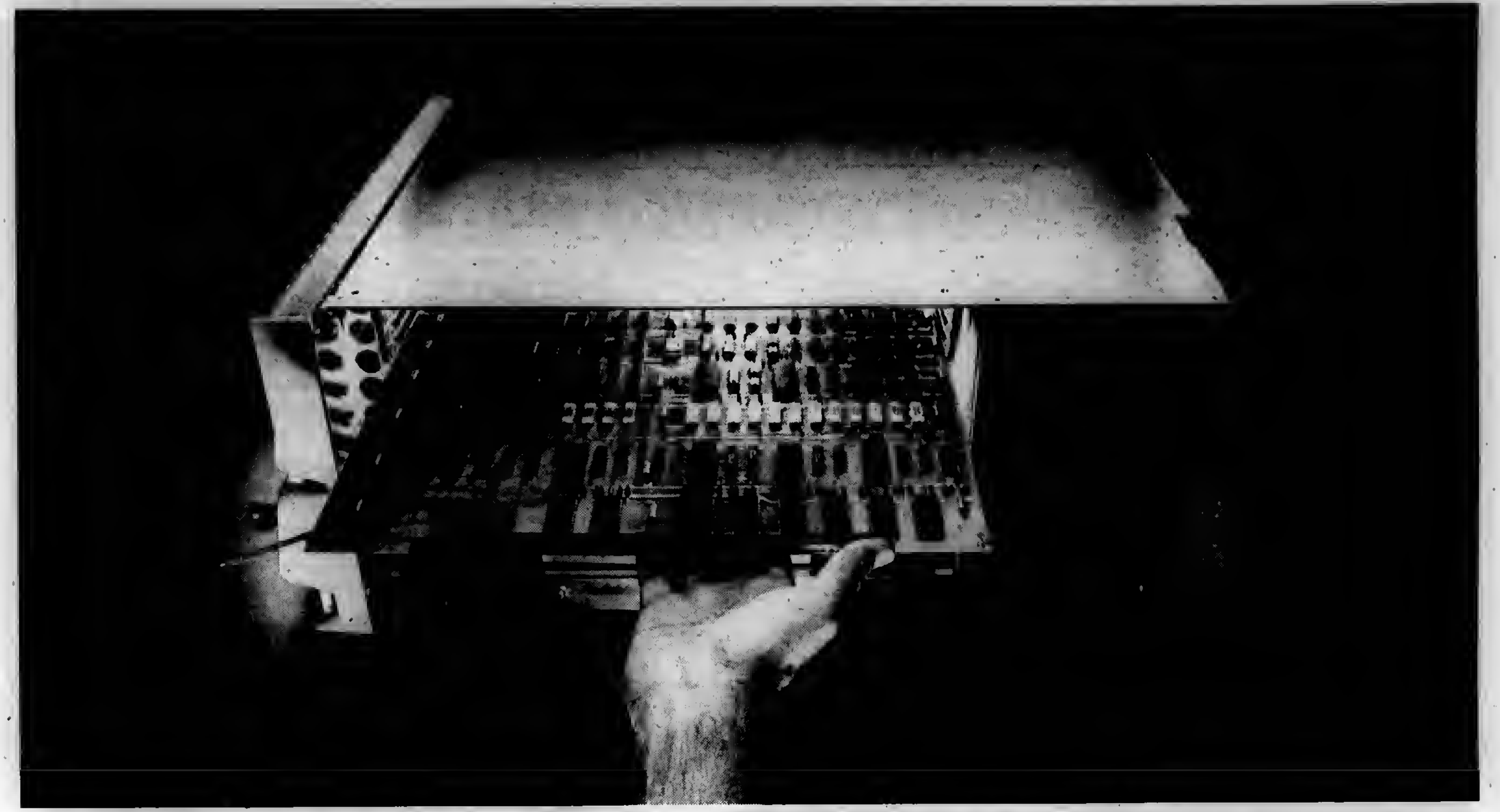

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Center of Data Acquisition System

Mini Improves Accuracy of Pacemaker Power Tests

MINNEAPOLIS – A data acquisition system built around a minicomputer has improved the accuracy as well as the speed of testing cardiac pacemaker power sources at Medtronic, Inc. here, the user said.

Chemical power sources, either single cells or multicell batteries, are a determining factor in the service life of cardiac pacemakers, according to Thomas Kuder, associate engineer at Medtronic and supervisor of the firm's power sources data acquisition system. Implantable cardiac pacemakers are the firm's major product line.

Prior to the installation of the automated data acquisition system, data from tests on cardiac pacemaker power sources was gathered manually and analyzed either with the aid of a calculator or a computer on a time-shared basis.

"By automating our tests, we've been able to gather more information over the running time of each test and to collect and analyze that information at least five to 10 times faster than we previously could," Kuder said.

The purpose of the testing is to evaluate the performance of various types of chemical power sources. The tests involve measuring the voltage of each battery or cell at specified intervals over periods of up to 10 years, Kuder explained.

Tests on 20 or more different types of power sources may be ongoing at any given time, with 50 to 250 of each type of power source included in each test batch, he said.

Walk-In Oven

Most of the tests are conducted in one of two walk-in ovens, each able to accommodate approximately 10,000 individual power sources.

The batteries and cells are attached to printed circuit boards, the reverse sides of which contain the circuitry which "discharges" the power sources.

The printed circuit boards are slid into racks inside the walk-in ovens, which are maintained at human body temperature. Each of the racks is wired to the test console of the data acquisition system.

The test console includes a programmable scanner, a programmable multimeter and a digital clock. The multimeter and scanner, under control of the Wang 2200, a minicomputer, take the voltage readings of each power source via plug connection from the test console to the printed circuit board inside the walk-in oven, Kuder explained.

Power source voltage data is transmitted from the test console to the minicomputer with CRT display, keyboard and 20,000 bytes of memory; a dual diskette drive; and a combination printer/plotter.

Kuder wrote all of the system software himself, although he had no previous experience with Basic. "It was a fairly difficult job because the software is very complex – it does a lot of things," he said, "but Basic was an easy language to learn."

The technicians formerly responsible for collecting test data manually now operate the computer system, he noted, adding "they are more involved in the testing process itself now that they use the computer."

The system maintains a schedule of all power source testing in progress. Each day, one of the technicians calls for a list from the computer of all tests due to be "read" that day.

In addition to providing that list, the mini displays the appropriate manual plug connection needed for each test reading.

To ensure the proper connection is made – and the appropriate test is read – the system verifies the plug connection by using the scanner and multimeter to read a known resistance assigned to each plug. Once the connection is made, the multimeter and scanner are directed to read the power source voltages and transmit them to the computer.

"The computer next displays the condition of that test on the CRT," Kuder continued. "The display includes summary statistics, like the mean and standard deviation of voltage readings, both for the present and the previous reading time. The system highlights those individual voltage readings outside certain designated limits.

"The technician has the option of calling for the voltage reading of each individual battery or cell, and he has the option of rereading the test. He then decides whether or not he wants to save the results of the reading.

Updating History File

"He can update the history file on that particular test, which he will do if any test member had been taken off test since the last reading. When he is finished, he moves on to read the next test," Kuder said.

When each test is completed – and some tests now on the system have been in progress seven years – the system automatically creates a permanent data file and prints an end-of-test report. In addition, Kuder noted, the system can plot voltage/time and voltage/capacity graphs and perform linear regression and a variety of other analyses of the completed test data.

"The data acquisition system has given us improved reliability in the areas of data acquisition, data storage and data analysis over our previous power source testing methods," he said.

The manual method of collecting test data involved a technician walking into a test oven and removing batteries and cells. Voltages were measured manually by touching each individual power source with the probes of a voltmeter.

"It was possible to short-circuit a power source during that handling, which meant eliminating each shorted unit from that test group," Kuder said. "Another disadvantage was that the power sources had to be removed from the body temperature environment for measurement."

Power Not Disturbed

Power sources under test now remain undisturbed during voltage readings, he said; the temperature therefore remains constant and the danger of short circuits is greatly reduced.

Another disadvantage of the manual testing method was the time involved in data analysis. "A decision might require the comparison of perhaps a dozen different tests on one type of power source. We'd want to look at the performance of that source over time, and quite often we'd need that information the following day," Kuder said.

The system provides regular reports which update and summarize all ongoing tests. Those reports reduce the need for "next-day" analyses, he added.

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.

Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

1. Data Communications Course #1010 — Practical Data Communications Systems and Concepts. Led by Dr. Dixon Doll, this two-day seminar is designed for people who are relatively new to data communications. It presents you with a comprehensive exposure to the important terminology, economic aspects, and functional characteristics of contemporary data communications devices, techniques and systems. Money-saving ideas are an important part of this seminar, and you will see how to implement them using innovative techniques like split-stream modems, diagnostics for fault isolation, modem-sharing devices and digital bridges, remote multiplexers/concentrators, and front-end preprocessors. The seminar will focus on the latest developments in data communications, such as SDLC, IBM's new Synchronous Data Link Control, DDS, Bell's new digital data network, and HID-LoD, Bell's newly effective tariff for voice lines. And we'll look at the impact of satellite carriers and specialized carriers as well. This seminar will give you the ability to recognize and solve specific problems in data communications so that you can effect cost savings and performance improvements at your installation.

2. Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design. Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Class study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own.

Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithms for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Proctor & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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CI Notes

TRW Buying OCR Wands From RPI for $15 Million

DALLAS – Recognition Products, Inc. (RPI) has received a $15 million contract from TRW for substantial quantities of its hand-held optical character recognition (OCR) wands to be attached to point-of-sale terminals.

Deliveries are scheduled to begin immediately and last for 20 months.

The OCR wands read alphabetic and numeric characters rather than bar codes. RPI is a wholly owned subsidiary of Recognition Equipment, Inc.

Inforex Changing Personnel Mix

BURLINGTON, Mass. – Inforex Corp. has reduced its employment rolls by 71 persons in the U.S. in preparation for reshaping personnel skills.

The firm said it recognized the need to add people who have both systems and software skills to reflect the increased use of microprocessors. Inforex plans to introduce a distributed data entry product this year.

In addition, Inforex is increasing its U.S. sales force by 20% by year-end, and a number of administrative positions have been eliminated in order to shift resources to the sales force.

About one-third of the 71 employees was in the engineering group, primarily with hardware skills, and one-half in indirect manufacturing.

The firm may be hiring direct production personnel before year-end, according to Tim Cronin, Inforex chairman.

HIS Forms Printer Group

WALTHAM, Mass. – Honeywell Information Systems, Inc. (HIS) has formed a separate group to handle all aspects of its high-speed, non-impact printer products.

The group, called the Page Printing System (PPS) organization, will be headed by Ronald F. Borelli, who will be in charge of management direction for engineering, manufacturing, supplies, home office product marketing and field marketing support activities as well as business planning.

"The new organization will capitalize on the promising worldwide market potential of the PPS and related future products by centralizing all product-related activities under single direction," according to Lee E. Sheehan, vice-president and manager for the company's North American computer operations.

Supershort

– – –

Prime Computer, Inc. has signed Saudi Computer and Management Consultants as its distributor in the Arab countries.

SIA Founder Predicts

Market Expanding for Software Firms

By Toni Wiseman
Of the CW Staff

NEW YORK – The trend toward decentralization and its accompanying trend toward turnkey systems may well hold the key to the future for many software companies, according to a founding member of the Software Industry Association (SIA).

The growth of minicomputers and microprocessors must be credited with a large portion of the software vendors' good fortune, Lawrence Schoenberg said in a recent interview.

The total U.S. software purchases by computer users and hardware manufacturers rose from $270 million in 1973 to $500 million in 1974 and $655 million in 1975, according to SIA figures. Between now and 1984, some $19 billion will be spent on software.

Of the approximately 800 independent software suppliers in business today, less than half realize more than $1 million in annual sales; about 1% do about 10% of the business, the SIA estimated.

Therefore, if there is no change in the structure of the industry by 1984 and 1% of the firms still do 10% of the volume, about eight companies will share a $350 million market, based on projected $3.5 billion volume by 1984.

Room for More Vendors

Schoenberg, however, feels there is room for many small companies in the marketplace.

Large companies have started to decentralize very rapidly, Schoenberg said, and in decentralizing functions they are also decentralizing authority for DP selection.

"The people who are now involved in making DP decisions are not the old computer people who historically were always the conduits for all computer work of various departments in a large company.

"Now this kind of power has been spread into the operating people, the marketing people, the engineering and the production people, so each one of these is now making decisions about his own equipment," he said.

This means, he noted, "that they are no longer interested in someone just coming in and writing programs for them; they have to have hardware as well."

This has resulted in a tremendous movement toward turnkey systems he said, with large companies requesting software vendors to put in bids that include both hardware and software.

Banks in particular are applying pressure on software vendors to provide total systems, he noted.

So, in addition to the regular problems, software companies are being faced with "white-collar" hardware/software problems, such as interfacing with particular units, Schoenberg said.

Small Business Sector

A second burgeoning area for the software industry, one which none of the "traditional" people are doing anything about, is small companies, Schoenberg stated.

"You have hundreds of thousands of them which are likely to be automating with computers over the next few years, and you have again the whole turnkey system approach," he said.

The problem from the software vendors' viewpoint is that the marketing impact so far has come from the mini manufacturers, which are "essentially representing out in the field that software is only 20% of the cost," Schoenberg said.

"They [the mini makers] want a bigger share of the bucks and try to leave very few dollars on the table, so none of us who have been in the business for a long time can figure out how anyone else can ever make money on it," he said.

There is a long list of companies who have failed in this sector of the software industry, Schoenberg said. "There are almost no companies that have ever made money and certainly the number that have is so miniscule compared with the number that have lost money that it's staggering," he added.

"Yet anyone can look out there and see that there's a gigantic marketplace," he said.

Growth of Marketplace

Vendors are always trying to discourage possible competitors from entering the software field, telling them it's impossible to make a buck, Schoenberg said.

"Fortunately for the economy, that's sheer malarkey. People were able to enter the field during the worst of recessions and still make money," he stated.

Growth for the computer software industry has hardly started, he said, and the reason is that almost all the work in the past has been white-collar work – after-the-fact work where someone generates a record and the software firm automates it.

"But now we're starting to see companies attempt to use computers in their main operations, in the basic flow of their

(Continued on Page 36)

DBMS Offerings Can Strengthen Vendor Account Control: Brueck

By Edith Holmes
Of the CW Staff

NEW YORK – Because data base management systems (DBMS) are powerful tools which are particularly attractive to users, the vendor which controls their supply strengthens its account control, according to Robert L. Brueck, president of MRI Systems Corp.

Defining "account control" as "a condition, from the vendor viewpoint, of being able to supply all products needed to take care of a customer," Brueck testified at the US vs. IBM antitrust trial recently that IBM holds 43% to 45% of the DBMS market.

IBM has attained 55% to 60% of the dollar value spent for DBMS software packages, he continued, citing International Data Corp. figures.

System 2000, MRI's DBMS, has 4% to 5% of the overall market; its percent of the dollar value spent is somewhat higher because System 2000 carries a larger price tag, Brueck said.

IBM's DBMS, IMS, rents for about $1,500- to $2,000/mo, he explained. System 2000 costs about $3,000/mo.

First announced in 1970 to run on Control Data Corp. computers, System 2000 was rewritten to operate on Univac 1100 equipment and on IBM 360/370 machines in the 1971-73 time frame, he said.

When Brueck sought capital sources for rewriting the System 2000, however, he had trouble finding people who would invest in his company, he told the court.

In detailing the reasons why MRI encountered investment difficulties, he suggested a number of larger software firms had just written off investment advances against their earnings during the early '70s.

In addition, software practitioners were considered performers of some kind of "black art" and hardware people really didn't understand what the programming business was all about, Brueck said. With the money market so tight and competition for funds so tough, he indicated, no one would invest in an unsure thing.

Finally, Brueck said, MRI was developing a product where the main market was IBM computers, thus putting the company in direct competition with the mainframer. No one in the investment market considered this kind of competition favorable, he said.

Today, between 65% and 70% of System 2000 installations are in IBM shops,

(Continued on Page 36)

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Court Told DBMS Strengthen Vendors' Account Control

(Continued from Page 35)

he estimated. Twelve percent to 15% are on CDC machines and the remaining 15% to 20% are on Univac machines.

Asked about the lengths to which MRI must go to redesign its product for other manufacturers' machines, Brueck said he has considered rewriting the DBMS for Honeywell mainframes. This effort would require $350,000 to $500,000, he estimated, depending how many modules of the system are rewritten.

Machines from Burroughs and Digital Equipment Corp. and several of the minicomputer makers would be good candidates for a redesign effort, Brueck said, again stressing "given the necessary funds."

Brueck emphasized the difficulty of writing software that is compatible with the hardware of all manufacturers. Even the two levels of System 2000 available aren't compatible, he noted.

MRI made major design changes in the structure and storage of data between Levels I and II. In addition, System 2000 is not easily transferable because it is written in Assembler for the most part, he added.

DBMS using Cobol and Fortran have a higher transferability rate, he said.

IBM's IMS is not machine-independent and has never been rewritten to run on other manufacturers' machines, to Brueck's knowledge. And IMS 1 has not been supported by the mainframer since the introduction of its virtual storage version, IMS/VS, he said.

But, an IBM spokesman later said, "IMS as used on 360 equipment is currently supported by IBM."

Users of IMS and System 2000 are "locked in" if they want to think about changing DBMS without giving up the capabilities and functions they have and starting over, Brueck stated, adding he considers "lock in" a term used for dramatic effect. He said he couldn't estimate the cost of going from IMS to System 2000, but it would be easier to go from a system like IMS with a data base language to System 2000.

When IBM introduced its VS2 Release 1.7 operating system, Brueck said, MRI's DBMS was not able to operate fully under it. In particular, he noted, System 2000's multiuser capability couldn't function.

The problem for MRI was obtaining the necessary information from IBM to provide that capability to users once again, he stated.

While he didn't know exactly how this IBM release affected MRI's marketing effort for System 2000, Brueck said he couldn't see how the operating system helped it.

In addition, MRI was slow to recognize its users would encounter the loss of the multiuser capability. Eventually, the necessary changes were made in System 2000, but it took about 18 months, from the December 1973 announcements of IMS/VS and the VS2 operating system release to mid-1975, Brueck said.

During that period, information MRI received from IBM on the problem was skimpy, inadequate and often delayed, he added. IBM considered its source code proprietary – and rightly so, Brueck stated, noting MRI was able to get the code by signing a software license agreement.

MRI used the license for one month, paid the fees for it and returned it to IBM, he said.

MRI had to adapt its data base system to run under IBM's VS2 because a number of MRI customers with IBM machines wanted to move to this operating system, according to the company's president.

In addition, a number of MRI's prospects – "rightly or wrongly" – were led to believe independents like MRI could not maintain compatibility with IBM systems in the face of interface and other engineering changes in system hardware and software, Brueck said.

Dataproducts Plans New Printer Family

NEW YORK – Dataproducts Corp.'s plans for a new printer family are proceeding apace, according to the firm's president, Graham Tyson.

One family of printers, which will offer substantially lower prices but remain in the traditional speed range of 300- to 1,800 line/min, is in the prototype phase; tooling has already begun, he told the New York Society of Security Analysts recently.

Eyes Low-Speed Market

In addition, Tyson said, the firm plans to enter the lower speed printer market, but he declined to give more information.

Printers account for 75% of Dataproducts' revenues; another 15% comes from its core memory business; and the remaining 10% comes from its Stelma subsidiary, which provides communications technical controls.

By concentrating on the core markets with the greatest longevity, the firm has "uniquely maintained strong, profitable operations" during the recession, and it is looking forward to a year "that could be as successful as any we have had in the past," he said.

The firm's market concentration is in areas where core has natural advantages over semiconductor, such as systems requiring very large storage, subject to adverse environments or requiring known long-term reliability, Tyson said.

Market for Software Growing: Schoenberg

(Continued from Page 35)

work, and that's a whole wild new area which is totally changing the scope of events," Schoenberg said.

In these instances, he said, firms are less likely to convert their methods to accommodate packages than when using packages for accounting functions.

Packages may be "a meaningful base from which you begin to develop a system for a specific company, but it's hard to envision that the package is going to represent a very high percentage of the total dollars expended on the finished product," he remarked.

Schoenberg, who is president of AGS Computers, said his software firm has grown at least 50% a year for the last 10 years and is expecting to grow about 70% to 80% this year. This trend is typical among software companies, he stated.

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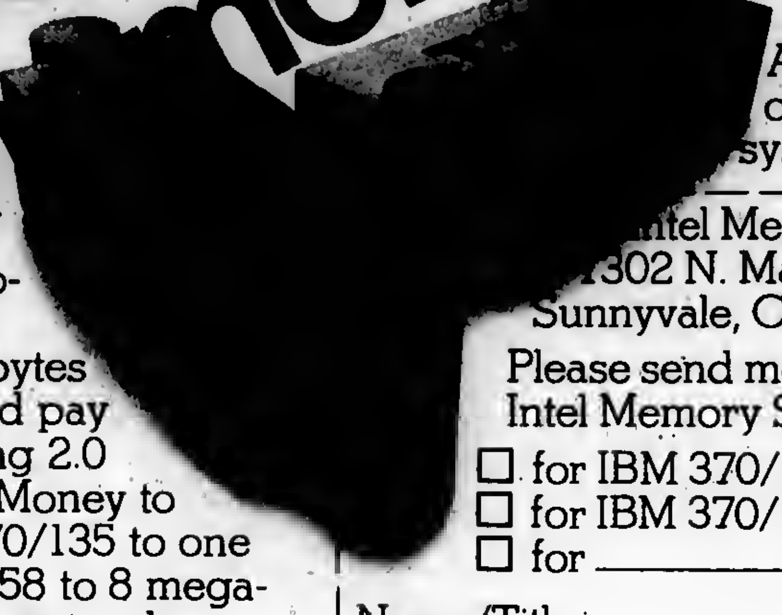

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International News

Westinghouse Packages Doing Well in West Germany

By Ivan Berenyi
Special to Computerworld

MUNICH, W. Germany – For U.S. software houses with European subsidiaries and for suppliers of U.S. packages, the economic recovery has not come a moment too soon. After two or three lean years, they are poised for a new boom – particularly in West Germany.

Westinghouse is a comparative newcomer to the European software market but, according to its regional software sales chief for German-speaking Europe, Vinod Bahl, its current growth rate is little short of phenomenal.

"We started from scratch in 1972, yet now have more than 320 customers," he said. "Our monthly turnover is $46,800 to $54,600, and sales are increasing so rapidly that I expect this to rise to $78,000 within six months.

"West Germany is the largest and fastest growing single market for Westinghouse software products in the whole of Europe," he said, but the company has also picked up 70 to 80 customers in the Basel-Zurich area in Switzerland and about 20 in Austria in little more than a year. Holland boasts 25 to 30 additional customers.

The recession has unquestionably helped to win over clients for Westinghouse's off-the-shelf software in a market which has traditionally been package-shy.

The oldest and most popular of the company's products is the disk utility package, which now has 250 users in German-speaking Europe.

The dump and restore package, an OS version of the same product, has proved almost as popular, and orders for later packages, like the Asap spooling software and Fast Linkage Editor, are also building up.

"The largest multiple users are banks," Bahl stated. "Bayerische Sparkasse has 16 installations, for instance, and Swissbank is another multiple user."

German DP Mart To Increase 16% Annually

SAN FRANCISCO – The DP market in West Germany will grow at an average annual rate of 16% and result in a $2.6 billion total market in 1977, according to a recent report by Fred Glynn/Marketing Research.

The report cited a U.S. Department of Commerce survey which indicated the use of computers and related equipment in West Germany is more extensive and more sophisticated than in any other nation except the U.S.

Total minicomputer sales will rise 170% over the 1972-77 period, jumping from $209 million to $565.7 million, the Glynn report stated.

During the same five-year period, annual sales of independently purchased peripheral equipment are forecast to increase from $180.7 million to $732.2 million, while data transmission equipment sales will grow at an average 47% annually, from $17.3 million to $119.4 million.

U.S. Leads

The U.S. historically has been West Germany's leading supplier of DP equipment, the Glynn report noted. "Trade sources predict that the technological superiority of U.S.-made equipment will enable American manufacturers to increase their strong lead during the 1973-77 period with the U.S. share forecast to climb from 48% or $303 million in 1972 to 57% or $636 million in 1977," the report stated.

Other major suppliers include France (14%), the UK (12%) and Italy (10%).

While the minicomputer share of the West German market is forecast to rise from 16.5% in 1972 to 21.5% in 1977, the market for small, medium and large systems will also remain strong with aggregate annual sales for the five-year period expected to exceed $5.3 billion.

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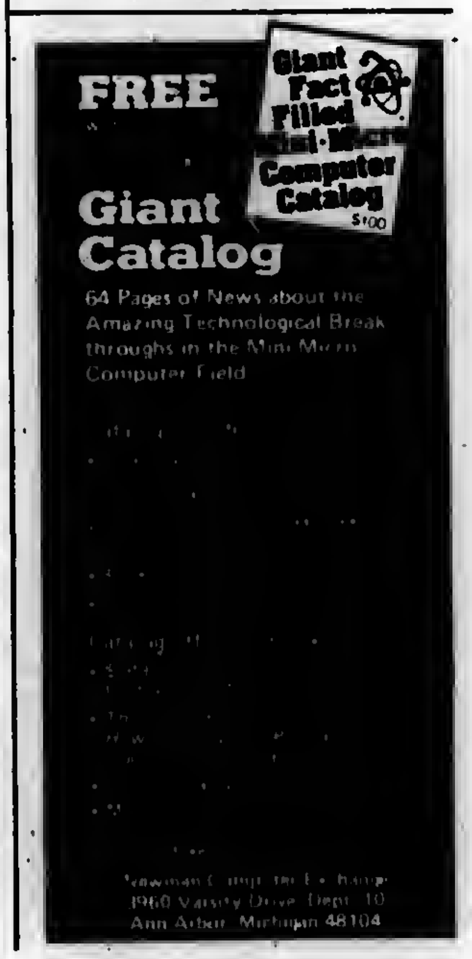

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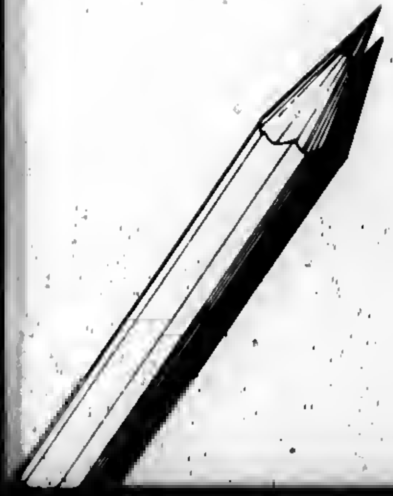

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But Profitable, Capex Head Says

Independent Software Seen Boosting IBM in Market

By Nancy French
Of the CW Staff

PHOENIX – By designing efficient systems software for IBM hardware, "independent software firms are actually enhancing IBM's competitive position, and that's too bad, but that's the only way we can make a fair profit," A. LeRoy Ellison, president of Capex Corp., said in an interview here recently.

If IBM's competitors were smart, they all would use the same instruction set and program interfaces for their systems, he said. This standardization would make it profitable for firms like Capex to bring non-IBM users the specialized systems that are now available only in the IBM marketplace.

This would make non-IBM systems more attractive to users and "improve business for everyone," he said.

Ellison blamed "the egos of computer designers" for the useless proliferation of unique instruction sets in the non-IBM world.

Capex was founded in August 1969, just two months before IBM unbundled its software and services. The original staff of eight were former General Electric and Univac people who felt the hardware manufacturers didn't really understand software, Ellison said.

Found Software Not Portable

At first Capex intended to furnish software packages for all manufacturers' systems but it soon learned systems software and operating systems were not at all portable, he said.

Starting from Square one, it took a technical team just as long to produce a system that would run on Univac systems, for example, as it did for one that worked on IBM machines – with only a fraction of the potential return on that investment of time and money.

Way over half the market still is running IBM 360s, providing a very large, homogeneous, software-compatible marketplace with thousands of potential customers, Ellison noted.

The other half is divided up among the various competitors, with each of them having only a few hundred, he said. Thus, IBM systems "is where the action is" from a profit standpoint.

Capex was financed with venture capital, according to Ellison, and the firm became profitable in 22 months. Today, the software company employs 40 people in eight sales offices in the U.S. and Canada. Capex software is marketed by other software vendors in other parts of the world, according to Don Rosner, vice-president of marketing.

Still privately held, the firm grew "in steady increments" until 1975 when sales surged ahead by 50%, according to Ellison, who said he expects growth to continue at that level.

Since January, Capex has chalked up a 35% increase in gross sales, and first-quarter earnings were right on target, Rosner said.

To individuals interested in starting an independent software house, Ellison gave this advice: it's harder to succeed than it appears. you have to do a good marketing job and have lots of staying power, he said.

Selling Strategy

Capex does its selling by slipping gently into an account with a sales contract and free use of its product for 30 days.

A technical representative installs the product, and the user can try it and return it in less than 30 days with no obligation, according to Rosner.

If he hasn't returned it at the end of that 30-day period, the sales contract automatically goes into effect.

In most cases customer problems can be diagnosed over the phone, or by examining a dump sent to Phoenix by mail.

Rosner could remember only one instance in the past year where a technical representative from Phoenix was sent to a customer's site.

Target Marketplace

Capex has aimed its products at the commercial rather than the scientific marketplace, and is oriented principally toward Cobol, Rosner said.

Its products are geared for IBM 370/135s or larger, run under OS or OS/VS, he said.

Its software falls into two broad categories: systems products and end-user products.

Among its systems products Capex offers PL-IV to help DP managers identify bottlenecks and improve programming reliability.

Cotune II works with the Cobol compiler on source code to make for smaller, more efficient programs, according to Rosner. A VS user might find it helpful in reducing paging, he said.

Among its end-user products the company offers Autotab II for use by nonprogrammers in financial planning, modeling and manipulation of rows and columns of numbers.

The Financial Result Simulation System (FRSS) models operations of a medium-size bank. On it, the nonprogramming user can model and assess the impact of changes in federal regulations.

The license prices for these systems products range from $5,000 to $20,000, plus an annual maintenance fee.

CW Photos by N. French

A. LeRoy Ellison

Don Rosner

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Shugart Drives Hit 30,000

SUNNYVALE, Calif. – Shugart Associates has shipped its 30,000th floppy disk drive.

"The fact that we made the quantum leap from 10,000 to 30,000 units in just eight months gives some indication of the growth in demand for low-cost random-access disk storage products such as our floppy," President Donald J. Massaro said.

"We believe that on the strength of our contracts and shipping rates, we now hold a commanding 45% share of the independent floppy drive market.

"In addition, figures show we are now booking 75% of the available major OEM contracts for floppies," he said.

Shugart recently announced long-range contracts with General Electric, Data 100, Univac, Applied Digital Data Systems, Hewlett-Packard, 3M, Tanbergs and Varityper, according to Massaro. He indicated "several more" are in the negotiation stage at this time.

Executive Corner

Two Named to IBM Vice-Presidencies

ARMONK, N.Y. – John F. Akers and James J. Forese have been elected vice-presidents of IBM.

Akers continues as president of the Data Processing Division, a post he has held since April 1974.

Forese was recently appointed president of the Office Products Division. He has been vice-president of finance and planning for the IBM World Trade Corp., IBM assistant treasurer and assistant group executive of the General Business Group.

Rogers World Trade Officer

MOUNT PLEASANT, N.Y. – C.B. Rogers Jr. has been elected to the board of directors of IBM World Trade Americas/Far East Corp.

Rogers is an IBM vice-president and president of IBM's General Systems Division.

Thompson Named at Sperry

NEW YORK – Kenneth F. Thompson has been elected an executive vice-president of Sperry Rand Corp.

Thompson will continue to serve as president of Sperry New Holland, the corporation's agricultural equipment division.

Other Moves

■ E. Gary Clark, a vice-president for large accounts development at Burroughs Corp. since 1974, has been appointed president and chief operating officer of Data Transmission Co. (Datran).

■ Decision Data Computer Corp. has elected four vice-presidents in different parts of the company. The list includes James J. Lysek, vice-president of finance and chief financial officer; Richard F. Taylor, vice-president of operations; Arthur B. Levin, vice-president of product development; and Richard L. Schwab, vice-president of sales and service.

■ Phillip J. Bifulk has been named vice-president of management consulting services at Control Data Corp.

■ Joseph L. Levy and William P. Ford have been named vice-presidents of the eastern and central regions respectively at International Data Corp.

■ John A. Pittman has been named vice-president of marketing and field operations at Storage Technology Corp.

■ Arnold D. Palley has been elected president and chief operating officer and A.H. Brawner Jr. has been named to the board of directors of Brandon Applied Systems, Inc.

■ Irving H. Hamlin has been appointed vice-president of marketing at Information Terminals Corp.

■ R. Bruce Sage has been elected president and a member of the board of directors of Wright Line of Canada Ltd.

■ Jean N. Tariot, formerly president of Incoterm Corp., has been named chairman and chief executive officer of the company; James F. Upton has been named president and chief operating officer.

■ M. Lloyd Bond has been appointed vice-president of salea of T-Bar, Inc.

■ Richard P. Carroll has been named vice-president of marketing and Donald R. Haring has been named vice-president of engineering at General Automation, Inc.

■ Harold L. Ergott has been appointed vice-president of computer products of the Norden Division of United Technologies and will manage Norden's newly formed Computer Products Center.

■ Richard Palmer has been named vice-president of international operations at Interdata, Inc.

■ Frank Edelstein and William W. Neal have been named staff vice-presidents of commercial services products and commercial service sales respectively at Automatic Data Processing, Inc.

Orders & Installations

GMS Systems of Chattannoga has installed the first Aide Transaction Processing System from Interactive System Technology.

The General Services Administration has ordered a Univac 1108-11 from American Used Computer Corp. for installation at the U.S. Army Missile Command.

Citibank has ordered a commercial automatic handwriting system, Signac, from Veripen, Inc.

Optimum Systems, Inc. has installed an IBM 370/168 Model III in its Santa Clara data center.

The Associated Press has ordered Delta 400 video display terminals from Delta Data Systems Corp. for use in its wire service network.

Avco Computer Services has installed an IBM 370/158 Model 3 to increase its DP capacity.

The Banking Center of Waterbury, Conn., has installed a Capacity Meter, a computer performance measurement system manufactured by CRU.

William H. Roberts & Sons, Inc. has installed a Burroughs B1700 system.

The State of Colorado has installed Adabas from Software AG as the data base system to be eventually available to all state agencies using the central DP facility.

Augsburg Publishing House of Minneapolis has installed a Burroughs B1726 system for filling subscriptions, inventory control, job costing, sales analysis and payroll.

The University of California has ordered the Libs 100 automated circulation control system from Computer Library Services, Inc. for a university-wide program for automation of library circulation operations.

The First National Bank of Richmond, Texas, has ordered a B700 system, AE 501 audit entry data preparation system and a S1500 data capture, transmission and document encoding system from Burroughs.

The State of Washington has installed a Univac 1100/41 system as part of the state's DP consolidation plan.

The University of Vermont has installed a Registration and Student Scheduling System assembled from Systems & Computer Technology Corp.'s Library of College and University Systems (Locus).

New Companies

Time Sharing Terminals, Inc. has been formed to provide end users and OEM's with terminals, ribbons and paper supplies. Service is available on a national basis, according to the firm at 8 Butterfield Court, Greenlawn, N.Y. 11740.

Machover Associates Corp. specializes in consulting services on computer graphics. Offices are located at 199 Main St., White Plains, N.Y.

Multiple Financial Services Ltd. is being formed to combine the investment fund administrative services of AGF Management with the processing service of Multiple Access, a supplier of computerized investment accounting.

Services will include processing of registered retirement savings plans, registered home ownership plans, investment trusts, deferred profit sharing plans and tax savings plans sold by insurance firms, the firm said.

Multiple Access, based at 405 Ogilvy Ave., Montreal, Quebec, H3N 1M4, will hold a majority interest in the firm.

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SYSTEMS ANALYSTS - PROGRAMMERS
COM SPECIALISTS

For Division Headquarters in Dayton, Ohio

You may be the person to complement our team of professionals. Immediate openings exist within the Home Office Staff for NCR's Data Processing Center Network.

Your On-line and/or Remote Batch programming experience may qualify you for participation in the development of a completely new and exciting Retail System including related application support software and utilities.

Your experience utilizing OS/JCL or DOS/JCL with COBOL and BAL may qualify you for a customer relations-oriented COM Specialist position, requiring development, installation and support of software for a variety of main frames.

A Bachelor's Degree (or equivalent experience) is required. On-line application design and/or development experience using COBOL is a definite plus.

If you have this background and desire to pursue a challenging career working with other technically-oriented professionals, your career with NCR may be about to begin. For more information on these positions, our excellent employee benefits and relocation package, send your resume and salary requirements in confidence to:

NCR

Mrs. Alice Freauf
Marketing Placement-Dept. 2080
NCR Corporation
Dayton, Ohio 45479

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POSITION ANNOUNCEMENTS

PROGRAMMER ANALYSTS

Starting salary $13-$18,000 depending on experience. Four openings in an expanding department with Western Farm Bureau Life Insurance Company using a System 370 Model 135 in Denver, Colorado. Three years of system design and programming experience in the Life Insurance industry is required. CFO or Life Comm and CICS experience is desired. Send resume and salary history in confidence to Personnel Manager, WFBLIC, 1200 Lincoln, Denver, Colo. 80203, or call Mr. Bandy or Mr. Thibodeau at (303) 861-8100.

SENIOR DATA BASE PROGRAMMER

To be involved in the development of a Data Base System.

Knowledge of DL/I, OS, and JCL required. Experience in COBOL and/or ALC is required. Degree and programming experience in CICS desirable.

- Excellent Benefits
- Permanent Location

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EDP SPECIALISTS

Partial List of Openings

Proj Mgr. * large scale	$23-25K
Prog Anal * COBOL OS/VS	15-19K
Syst Anal/Prog * IMS Mfg	18-22K
Syst Prog * VM/370 * CP/CMS	15-20K
Minis Syst/Prog * many	15-20K
Tech Spc * Fortran/PL-1	15-20K
Data Base Spec * IMS/VSAM	18-22K
Software Spec * all lang	15-25K
Mgr EDP * S/3 Mod 10 RPG	16-20K

SEND RESUME IN CONFIDENCE
To: Sharon Schoonmaker

ROBERT HALF
PERSONNEL AGENCIES
111 Prospect St.
Stamford, Conn. 06904
(203) 325-4159

TELECOMMUNICATIONS ANALYST

TUNE IN TO THE CNA NETWORK!

CNA, a leader in the insurance industry with world headquarters in Chicago is seeking an experienced telecommunications analyst ready for increased responsibility for the research/implementation of our recently installed telecommunications network for our sophisticated IMS Computer System. Including full design and technical control, your background of at least 2 years in Computer System or Data Communications is desirable, but we will consider a graduate with a degree in Computer Science or Electronics Engineering. The salary is excellent, plus a comprehensive fringe benefit program and exceptional professional growth opportunity. Please send letter or resume to Employment Coordinator.

INSURANCE FROM CNA

CNA PLAZA
Chicago, Illinois 60685
An Equal Opportunity Employer M/F

ANALYST/PROGRAMMER

We are seeking an Analyst/Programmer with a strong background in minicomputers. This individual must have had heavy programming experience with a low level (assembler) language on business applications. A knowledge of data communications is also beneficial (Singer 10 experience a plus, but not mandatory). This person will have the project responsibility on a number of minicomputer related applications and evaluations. On-going support on already installed minicomputer installations will also be required. Areas of exposure include: (1) Pharmacy Applications, (2) Distribution Systems, (3) On-Line Data Communications, (4) Manufacturing Systems. This person must also possess strong analytical management skills who can effectively communicate, both written and orally, at all management levels. Unless you are an above average energetic individual, willing to put forth the required effort, and are seeking a solid career growth path — you need not apply.

OPERATIONS ANALYST

The analyst required for this position reports on staff directly to the Director of Data Processing. Responsibilities include providing liaison between the Applications Systems and Programming personnel and Computer Operations. Also, this analyst will aid in implementing system software changes and new versions, coordinating this activity with the hardware vendor. In addition, the analyst will design and implement, in a project environment, projects identified to provide an improved operational environment, i.e., scheduling, monitoring and performance evaluation systems, and should be thoroughly familiar with logging facilities on Burroughs equipment.

This function requires at least two years of proven system software experience with Burroughs 700 family equipment. This analyst should also have at least two additional years of applications-oriented implementation experience.

Send resume and salary history (in confidence) to:

Personnel Depatment,
REVCO D.S., INC.
1925 Enterprise Parkway
Twinsburgh, Ohio 44087
Equal Opportunity Employer M/F
or call: 1-216-425-9811 for an interview

EMI

engineering

FIELD SERVICE OPPORTUNITIES

FIELD ENGINEERS

WE have immediate openings for seasoned Field Engineers in your area as well as in many other locations throughout the country.

These choice opportunities require professionals with three or more years service experience in mini computer based systems. Experience in electromechanical devices would prove extremely helpful.

TECHNICAL SUPPORT

We also have several key positions in our Northbrook Corporate Headquarters (an attractive Northern suburb of Chicago) for Technical Support Engineers.

EMI Medical Inc. is an internationally known company in the midst of a vigorous expansion program. Continued growth assures you outstanding potential for both personal and career achievement.

We offer an attractive compensation package in line with your background and capabilities plus participation in an outstanding benefit program.

For confidential consideration, please send your detailed resume including salary history to:

SERVICE OPERATIONS MANAGER

EMI MEDICAL INC
3605 Woodhead Drive
Northbrook, Illinois 60062
An Equal Opportunity Employer M/F

SYSTEMS ANALYST

(MARKETING INFORMATION SYSTEM)

R.J. Reynolds Industries, Inc. has an opening within its Corporate Systems Department in the area of marketing related systems. Corporate Systems is presently forming a project team to develop and implement a highly sophisticated Marketing Information System.

Applicants should possess the following:

- Undergraduate degree in Business, Marketing, or Statistics.
- Experience with data base systems, i.e., IBM's C.M.S., DL/1, and G.I.S.
- Knowledge of Cobol, Basic and Fortran.
- Good Communication and analytical skills.
- Ability to interface with all levels of management.

Excellent benefits package, including assistance in sale of present home and paid relocation.

Send resume and salary history, in confidence, to:

Denis G. Simon
Corporate Employment Department
R.J. Reynolds Industries, Inc.
401 North Main Street
Winston-Salem, North Carolina 27102

RJR

TECHNICAL RECRUITER

If you like the idea of working with a small but highly skilled personnel group in an advanced technology environment, this could be the career move you've been seeking. In fact, we may be singularly right for each other if you have also been thinking about relocation to the beautiful Pacific Northwest. In Beaverton, Oregon, near Portland, Tektronix, Inc., designs and manufactures precision electronic equipment and intelligent graphic display terminals. You'll be stepping into a growth situation with the responsibility of bringing computer professionals and technically oriented sales and marketing people on board. General personnel experience is appropriate ideally in a marketing or computer science organization. Excellent communications ability and people skills are important. Female and minority candidates are urged to apply for this position.

PERSONNEL

You will receive an attractive compensation package including liberal insurance and retirement programs, educational support and profit sharing. Of course we will relocate you to Oregon.

Please send your complete resume to:
Dan Thompson, TEKTRONIX, INC., P.O. Box 500, C71, Beaverton, OR 97077.
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and indicate position title.)
Or call your nearest Source Edp Office:

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East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).
Midwest: Chicago (312) 782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).
South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).
West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

CSC

H-6000 SPECIALISTS

OVERSEAS ASSIGNMENTS IN IRAN

Computer Sciences Corporation, as part of our worldwide expansion efforts in the information sciences, has immediate openings in Tehran, Iran for persons experienced with H-6000 series computers.

These positions require 3-5 years of experience with H-6000 computers in the following areas:

- Applications Programming
- Computer Operations Management
- Data Base Design
- Systems Software Development
- Data Communications
- Training

Responsibilities will include the design and development of large scale management information and command and control systems necessary to automate a variety of military administration systems for the country of Iran.

CSC offers excellent starting salaries and a complete benefits package which includes a liberal relocation policy and overseas allowances for the employee and family during the 18 month tour.

Please send resume and salary history in complete confidence to:

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111 Pearl St.
Hartford, Conn. 06103
(203) 278-7170

COMPUTER PROGRAMMER

Marathon Oil Company
Research Center
Littleton, Colorado

BS or MS degree in Computer Science or equivalent with 1-3 years experience in data processing, programming in library science application, inventory control, and/or data base management. Must have knowledge of currently available hardware and software technology. Experience with Burroughs B-6700 preferred. and knowledge of ALGOL and COBOL or PL/1. Candidate must be a self-starter, able to work independent of close supervision, Excellent fringe benefits.

Send resume to Ms. Susan Barrett, P.O. Box 269, Littleton, Colo. 80120, or call (303) 794-2601 ext. 621

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Compu-Search has sought out exceptional individuals with Data Processing-related skills for large and small companies throughout the United States and Canada. We also have been very successful in locating challenging new positions for thousands of people who have requested our assistance. If you are a talented achiever interested in hearing about situations that will best meet your goals, contact our office near you in complete confidence. We keep a close watch for the best opportunities available to you locally and nationally. Call for information.

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PROGRAMMERS & ANALYSTS

SUNNY FLORIDA

BCC is the data processing arm of a $2.3 billion statewide banking organization. Six regional centers feed two 158's under OS/VS1 to serve over a million customers. Our growth is exciting; the challenges are tremendous.

Proven achievers are needed immediately as APPLICATIONS PROGRAMMER/ANALYSTS, PLANNING ANALYSTS, and SYSTEMS PROGRAMMERS. Exposure to banking systems is a definite plus.

If you desire professional growth in an environment that recognizes excellence, we offer attractive salary, benefits, and promotional opportunities. Send your resume and salary history in confidence to Manager of Personnel.

Barnett Bank

BARNETT COMPUTING COMPANY.
P.O. Box 10068
Jacksonville, Florida 32207
A subsidiary of Barnett Banks of Florida, Inc.
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SENIOR SYSTEMS ANALYST

NCR's Communication Systems Division is seeking an experienced Systems Analyst with a strong background in software evaluation. Familiarity with microprocessors used in terminals, controllers front-end systems and 8080 assembler language required. COBOL language and operating systems experience helpful. Please send your resume and salary requirements in complete confidence to:

Industrial Relations Department
Communication Systems Division
NCR Corporation
3325 Platt Springs Road
West Columbia, S.C. 29169

NCR

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Faculty Position

Data Processing

Many leading technical minds have banded together to provide qualified deaf students with continuing education. These professionals enjoy the support of the Rochester Institute of Technology and an existing construction expansion program.

This opportunity calls for an individual with a Degree in Computer Science or related field, 3 years experience-business or industry, with emphasis on COBOL. Master's Degree and teaching experience preferred, but not required. Programming project supervision background desired. The position requires knowledge of or willingness to learn Manual Communication.

You will teach introduction to D.P., COBOL, BAL; introduction to Systems Design and/or D.P. Project classes. Responsibilities also include curriculum development, academic advising, tutoring and planning.

Besides unusually rewarding career satisfaction, you'll enjoy an attractive salary and benefits program. Please send your resume or "C.V." in strict confidence to:

NTID PERSONNEL COORDINATOR.
NATIONAL TECHNICAL INSTITUTE FOR THE DEAF
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Rochester, New York 14623
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Software Specialists

We have immediate opportunities for Software Specialist in the following areas:

370/158 VM CP/CMS

To support and enhance applications, assist programmers in coding difficult or critical parts of applications, and serve as Consultant on operating system-application interface problems. Large systems design experience, planning, and coordination skills desirable. Opportunity for early advancement to project leadership if desired.

DISTRIBUTED PROCESSING

To design and implement a distributed processing capability using DEC PDP-10's, IBM 370's, TYMNET (our international communications network), intelligent terminals and minis. These components, programmed on-line in several languages will be intergrated into structured systems supporting application development. We're looking for professionals with broad experience and knowledge to create high quality products. Good written and oral communication skills are a necessity.

These positions all offer excellent salaries and benefits, plus exciting advancement potential with a leader!

If qualified, send your resume with salary history in confidence to:

TYMSHARE INC.

J. MALONE.
(408) 257-6550
20705 Valley Green Drive
Cupertino, Calif. 95014

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Programmers/Engineers

SYSTEMS PROGRAMMERS SYSTEMS ENGINEERS

Amdahl 470V/6™ shipments are creating exciting career opportunities for qualified Systems Engineers and Systems Programmers. Positions exist both at our customer installation sites and at our California headquarters facility.

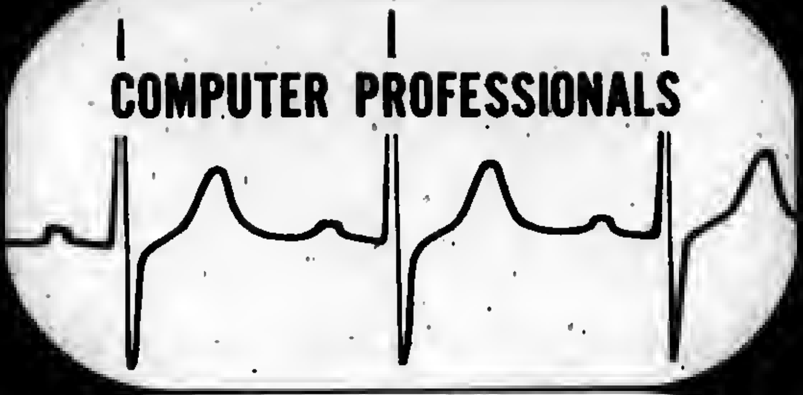
For the Systems Engineering positions, we seek individuals who have experience with large-scale OS/MVT or VS2 systems. A proven track record and self-motivation are prerequisites. Travel opportunities exist for those candidates who find it desirable.

The Systems Programmer candidates must have experience with OS/MVT or VS2 internals. Special consideration will be given to those with solid MVS experience.

For immediate consideration call (408) 735-4116 or send your resume to: Amdahl Corporation, Professional Employment, 1250 East Arques Avenue, Sunnyvale, California 94086. An Equal Opportunity Employer M/F.

amdahl

COMPUTER PROFESSIONALS



The automated health care industry is one of the fastest growing in the U.S. TELEMED Corporation is the world's largest processor of electrocardiograms (ECG's) by computer. We are a profitable, fast growing public company. We seek superior professionals with solid backgrounds in the following areas to fill immediate openings created by internal growth:

OPERATING SYSTEMS: You would work on one of the most sophisticated DEC systems 10 sites in the Midwest. We have plans to upgrade our existing 2 KI10s to 2 KL10s with 256K within one year. We need experienced people to develop assembly language application programs under TOPS10, do performance analysis, modify 6.02 TOPS10, and design and implement software for front end minicomputers in a real time, fault tolerant environment.

SYSTEM INTEGRATION: We need a real heavyweight in computers to integrate turnkey systems. Someone with extensive experience in assembler languages, operating systems, applications programming and hardware. An individual who can coodinate all the software and hardware resulting in a complete system to be delivered on time to a customer. Lots of experience with computers is required for a very nontrivial system. A very important corporate job! Take charge individual needed to deliver customer systems and reduce existing backlog.

TURNKEY ENHANCEMENTS: As we integrate new customer systems we need an experienced individual to make enhancements to tailor systems to specific customers. Because of the amount of software involved (nearly 100,000 lines of Fortran and assembly coding) this is definitely not a job for a beginner. Many of the programs are extremely complex.

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TELEMED provides a stimulating and challenging environment for highly qualified individuals. We have two Xerox Sigma 5 computers, two DEC KI10 computers and 5 minicomputers of various manufacture. We have been described as the largest realtime medical data processing facility in the world. We provide resources to maximize your efficiency and technical achievements through your own CRT for timesharing or hands on minicomputer machine time. Our rapid growth creates advancement possibilities for the future. Please indicate areas of interest in reply:

TELEMED CORPORATION

Software &
Professional Recruitment
TELEMED CORPORATION
2345 Pembroke Avenue
Hoffman Estates, IL 60195

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REPRESENTATIVES WANTED

We are a young company marketing a unique, micro-processor based terminal, using a handheld OCR-Wand for input, to solve defined problems in inventory control, order entry, and distributed data collection. Ideal reps would have end-user sales experience in hardware systems. This is a new opportunity with exceptional potential in an exciting growth area. Most regions open. Please reply to:

Elvin E. Smith, Vice President, DataPhase Systems Inc., 4520 Belleview, Kansas City, Mo. 64111 (816) 931-7927

PROGRAMMER ANALYST

IBM 370-125 DOS-VS installation with 3270's. Need an individual with proven analysis experience, IBM, OS or DOS and COBOL. Competitive salary and excellent fringe benefits.

Send resume to:

Personnel Manager
BLUE CROSS-BLUE SHIELD OF WYOMING
P.O. Box 2266
Cheyenne, WY 82001

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35 year old National Corp. desires to add to its staff a degreed programmer/analyst whose background includes manufacturing, on-line and data base programming and design experience. New 370/125 installation. Good starting salary, company paid profit sharing and stock bonus programs.

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Excellent growth opty with fast-growing Boston area mfg co. This position requires above average technical skills + proven ability to interface w/user mgmt. You should have strong COBOL prog skills, exp designing acctg/fin'l systems & the ability to learn new concepts quickly. Salary to $20K (fee paid). Contact Bill Grady (in confidence).

ROBERT HALF
PERSONNEL AGENCIES
140 Federal St.
Boston, Mass. 02110
(617) 423-6440

PROGRAMMER/ANALYST

Liberal Arts College

20 miles from NYC, seeks qualified individual to join the programming & systems group. At least 3-5 yrs experience; knowledge of PL/1 a must, COBOL, DL/1, CICS. Experience in college work and on-line systems a plus. Excel benefits including 1 month vacation. Send confidential resume & salary history to:

Antony Haleris, Director
Iona College Computing Center
New Rochelle, N.Y. 10801

SOFTWARE OPPORTUNITIES

systems programmer

Requires 5-6 years experience in systems programming with IBM 360 or 370 OS/VS system. Person should have knowledge of SYSGEN, Assembly language, PL/1, FORTRAN, COBOL, and JCL utilities.

Will be responsible for operating systems maintenance, software support work, installation of new software and user support. Equipment utilized is a 370-158, OS/VS1 with RES support.

software engineer

Requires BS degree in Electrical Engineering or Computer Science. Person should have experience with IBM 370, JCL, FORTRAN, and PL/1. Experience programming minicomputers in Assembly and FORTRAN languages required. Work will involve scientific programming and analysis in an engineering environment.

These positions offer a good starting salary and benefits program and an attractive opportunity for growth. If interested and qualified, please submit resume and salary requirements to: Employment Manager.

Itek

Optical Systems.
A Division of Itek Corporation
10 Maguire Road
Lexington, Massachusetts 02173

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SOFTWARE

Computer Associates Incorporated, one of the world's leading independent software development and marketing organizations, recently purchased the Software Division of Standard Data Corporation and is seeking top computer professionals in the following areas:

Market Representatives

Our product line includes the highly successful CA-SORT system with over 800 installations throughout the world as well as other software products for DOS, OS, VS and a full line of software for VM/370. Sales reps are needed for territories throughout the United States and Canada. Previous experience with system type packages is desirable. If you are not afraid to work and want to be well compensated for your efforts, contact us.

Systems Development

This position requires individuals who can work with a minimum of supervision. Background to include software system programming for IBM 360/370 series. Candidates must have experience on DOS and/or DOS/VS internals. Teleprocessing experience is desirable. Excellent opportunity to develop with a dynamic software company and join the exciting world of software products development.

Starting salary is excellent and full insurance benefits are provided.

Please send resume to Mr. Charles B. Wang, president, Computer Associates Incorporated, 655 Madison Avenue, New York, NY 10021. Or call (212) 355-3333.

COMPUTER ASSOCIATES

SR. SYSTEMS ENGINEER

Aggressive, innovative problem solver to participate in developing and installing life insurance systems.

A progressive leader in the life insurance industry has opportunities available for several individuals with 3 or more years experience in Data Processing. If you are presently working for a life insurance company or consulting firm and possess current programming skills in IBM ALC or COBOL under DOS or OS, consider this opportunity to join an outstanding team.

Experience in CFO or Life/70 helpful.

Call or send your resume to Randolph (Jack) Edwards today. Jack has been in life insurance data processing and consulting for 18 years, and can tell you where the best opportunities are.

Randolph (Jack) Edwards
F.L.M.I.

DATA PROCESSING CAREERS,
7715 Chevy Chase Dr., Suite 125
Austin, Texas 78752
(512) 452-0971
Personnel Consultant

Faculty Positions
In Computer Science

Department with programs in Business, Arts & Sciences, Engineering and Journalism seeks two assistant professors. Ph.D. preferred. September and January openings. September 30 closing for applications.

One position requires knowledge and experience in business data processing, including structured programming in COBOL and RPG, experience in database management system technology and familiarity with at least one functional system.

The other requires knowledge of operating systems and systems software principles, experience in implementing advanced operating systems and/or higher-level language compilers.

Visiting and interim professor and postdoctoral inquiries are also sought for positions in a challenging program in very pleasant surroundings.

Forward resume to R.A. Ramey, Acting Chairman; Intercollege Department of Computer and Information Science, 512 Weil Hall, University of Florida, Gainesville, Fla. 32611.

Mini-Computer Programmer

A rapidly growing software firm has an immediate opening for an experienced mini-computer programmer. Applicant should have experience on the Varian V-70 series or other mini used as a Front End Processor in the financial or thrift industry. Excellent opportunity for growth. Salary commensurate with education and experience. If interested mail resume to:

PAN AMERICAN
SYSTEMS CORP.
110 E. Morse Blvd.
Winter Park, Fla. 32789
Attn: Mr. Tom Hardy

SENIOR SYSTEMS PROGRAMMER

Central New Jersey subsidiary of a Fortune 50 company has immediate opening for qualified senior systems programmer in its MIS Technical Services department.

Challenging career opportunity exists for technically competent applicant with minimum 3 years systems programming experience plus extensive IBM 360/370 DOS background in a heavy multiprogramming/spooling environment. Programming languages used are BAL and COBOL.

It is advantageous if background includes a working knowledge of current software (Librarian, JASPER, ASAP, CA-Sort, AMIGOS). Previous experience utilizing software/hardware tools for system performance evaluation and tuning is a plus.

To technician with good communicative skills and proven ability to evaluate, generate, implement and maintain software/hardware requirements, we offer attractive benefits in a corporate group servicing multiple locations.

Please send resume in confidence including present salary to:

CW Box 4738
797 Washington St.
Newton, Mass. 02160
Equal opportunity employer M/F

Computer Operator

Experienced on IBM System 3, Model 10 or 12. Knowledge of RPG 2 Helpful. Looking for a real hands on, capable operator who can assist in managing an excellently designed system. Office located in Northern Bergen County. Send resume with salary requirements to:

CW Box 4736
797 Washington St.
Newton, Mass. 02160

SYSTEMS ANALYST

PACER Systems, located in Arlington, Virginia has openings for Systems Analysts. Desired backgrounds include: simulation and gaming, system design, operating systems, real-time computation, and graphics. PACER Systems has an excellent company paid benefits package and provides an attractive work environment in the Crystal City complex. Resume and salary requirements to:

PACER SYSTEMS, INC.
Dept. SG
1755 S. Jefferson Davis Highway
Arlington, VA 22202
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COMPUTERS

Exceptional opportunity for a person to take charge of our internal computer operations. Must have thorough knowledge of programming, mini computers, assembly language, and a strong background in typesetting applications. Must have knowledge of hardware and in-line interfaces.

If your background and experience meet our needs we will offer a commensurate salary with all fringe benefits and profit sharing.

Send resume including salary desired to

VP Operations
CW Box 4735
797 Washington St.
Newton, MA 02160
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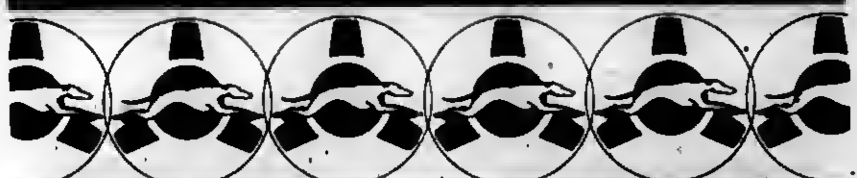

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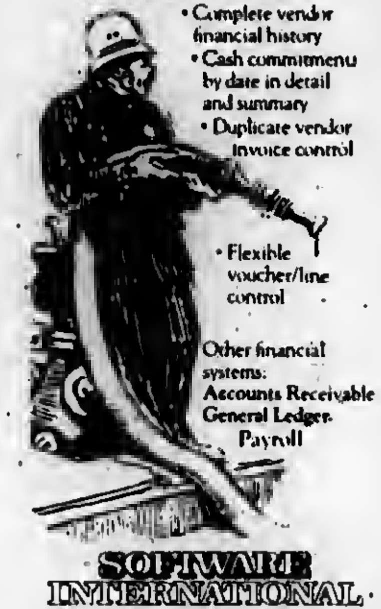

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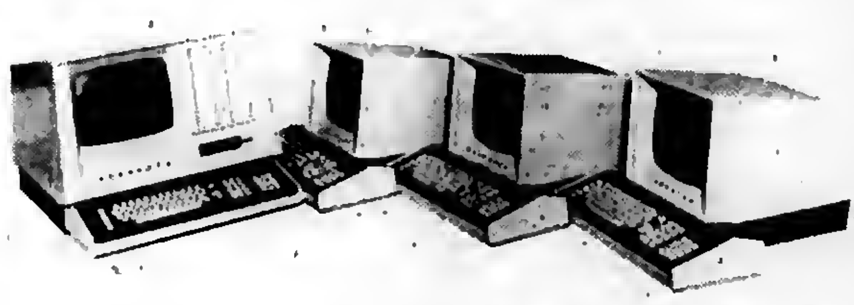

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But Dipped in First Quarter

Pertec Earnings Better Than Expected

MARINA DEL REY, Calif. – Although Pertec Corp.'s first-quarter results were better than the firm had anticipated, earnings were less than those of the year-ago quarter.

The results for the quarter included those of Computer Machinery Corp. (CMC), acquired on March 30.

"CMC, which had recorded sizable losses from operations in the three quarters prior to the acquisitions, achieved a better than break-even performance in our first quarter," according to Ryal R. Poppa, Pertec president.

"This places the potential recovery of the CMC Group ahead of our earlier anticipations and allows us to be more optimistic than in the past regarding Pertec's return to previously attained profit levels," he added.

Pertec's Peripheral Equipment Division is having a record year with quarterly revenues up 27% and income 43% ahead of last year's comparable period, he said.

However, as anticipated, income and revenues declined at the Business Systems Division (BSD) compared with the year-ago period.

Poppa believes the BSD has "leveled off and will now show improvement in each successive quarter for the remainder of fiscal 1977."

Pertec's revenues rose to $21.3 million in the quarter compared with $13.5 million in the same period last year.

Earnings, however, dropped to $874,000 or 17 cents a share compared with $956,000 or 31 cents a share in the period ended June 27, 1975.

Backlog increased to $85 million at the end of the quarter compared with $64.8 million at the end of the previous fiscal year.

Pertec has received initial notice from the purchasers of CMC's French and German subsidiaries that certain breaches of warranties exist regarding representations and warranties made to them, the company said.

However, it added, it does not believe the outcome will have a materially adverse effect on the financial condition of the company.

Wyly Revises Recapitalization Plan And Indicates Datran On the Block

DALLAS – In yet another effort to keep fiscally afloat, Wyly Corp. has revised its recapitalization plan which, if completed, would reduce its consolidated debt about $95 million and its estimated 1977 interest payments on debt by $6.7 million, according to the company.

Wyly has indicated its Data Transmission Co. (Datran) unit is for sale because it is unable to satiate Datran's large cash appetite.

In addition to two new issues of convertible preferred stock and a one-for-two reverse split of its currently outstanding common, the recapitalization plan includes the "quasireorganization" accounting procedure which would eliminate the deficit in Wyly's retained earnings account by a charge to paid in capital.

Wyly has filed the plan with the Securities and Exchange Commission.

The firm indicated it doesn't expect to be able to pay a $1.4 million semiannual interest installment due Sept. 15 on its 7.25% debentures.

Wyly plans to ask debenture holders to tell the debentures' trustee, Citibank, not to speed up maturity of the issue if it does not meet the payment by the end of the grace period on Oct. 14, it said.

In the event this payment is not made and holders of 25% of the debentures amount declare the principal due, Wyly said it will ask them not to demand payment or bring proceedings to collect the money.

If the payment is not made, the firm observed, either Citibank or holders of the 25% principal amount of the debentures could declare the $39 million principal amount of the issue due immediately.

The recapitalization plan, subject to approval by shareholders, 90% of its 7.25% debenture holders and all holders of its 4% capital notes, calls for holders to exchange these issues for a new Series A convertible preferred and Wyly common.

Originally the plan was to exchange these issues for 6% convertible debentures.

In addition, the plan also calls for Walter Haefner Holding AG of Zurich, Switzerland, to convert certain of its holdings into a new class of Series B convertible nonvoting preferred stock rather than shares of a new nonvoting class of common stock as previously proposed.

In exchange for the new Series B stock, Haefner is to convert $43.1 million in notes and debentures of Wyly and Datran and $3.9 million of Datran, both of which are secured by substantially all assets of Wyly and Datran, as well as a $5.4 million Wyly note.

SEC Snag Delays Issue of Amdahl

NEW YORK – The initial public offering of nearly 1.1 million shares of Amdahl Corp. common stock ran into a snag recently when the Securities and Exchange Commission (SEC) held up the release pending a resolution of differences between it and Amdahl and its accountant, Arthur Anderson & Co., over the treatment of the sale of a 470V/6 to a Canadian customer last month.

Scheduled to be released Aug. 5, the issue will be available Aug. 12, according to a spokesman for The First Boston Corp., managing underwriter,

The SEC objected to Amdahl's treatment of the transaction as a sale, indicating it should have been treated as an operating lease.

Amdahl sold the 470V/6 to Canadian Pacific, which obtained financing from Mitsubishi Bank. The terms of the agreement provided that if Canadian Pacific wanted to terminate the lease at the end of four years, Amdahl would pick up the difference, if any, between the current market value and half of the $880,000 remaining under a six-year amortization schedule.

Fujitsu would pick up the other half, the First Boston spokesman said.

In order to expedite the offering, an amendment to the prospectus was filed which satisfied the SEC's definition of a sale, he added. Amdahl agreed to pay Mitsubishi Bank $44,000 to take the full risk of assuming any differences in the value of the machine should Canadian Pacific terminate the lease after four years, he said.

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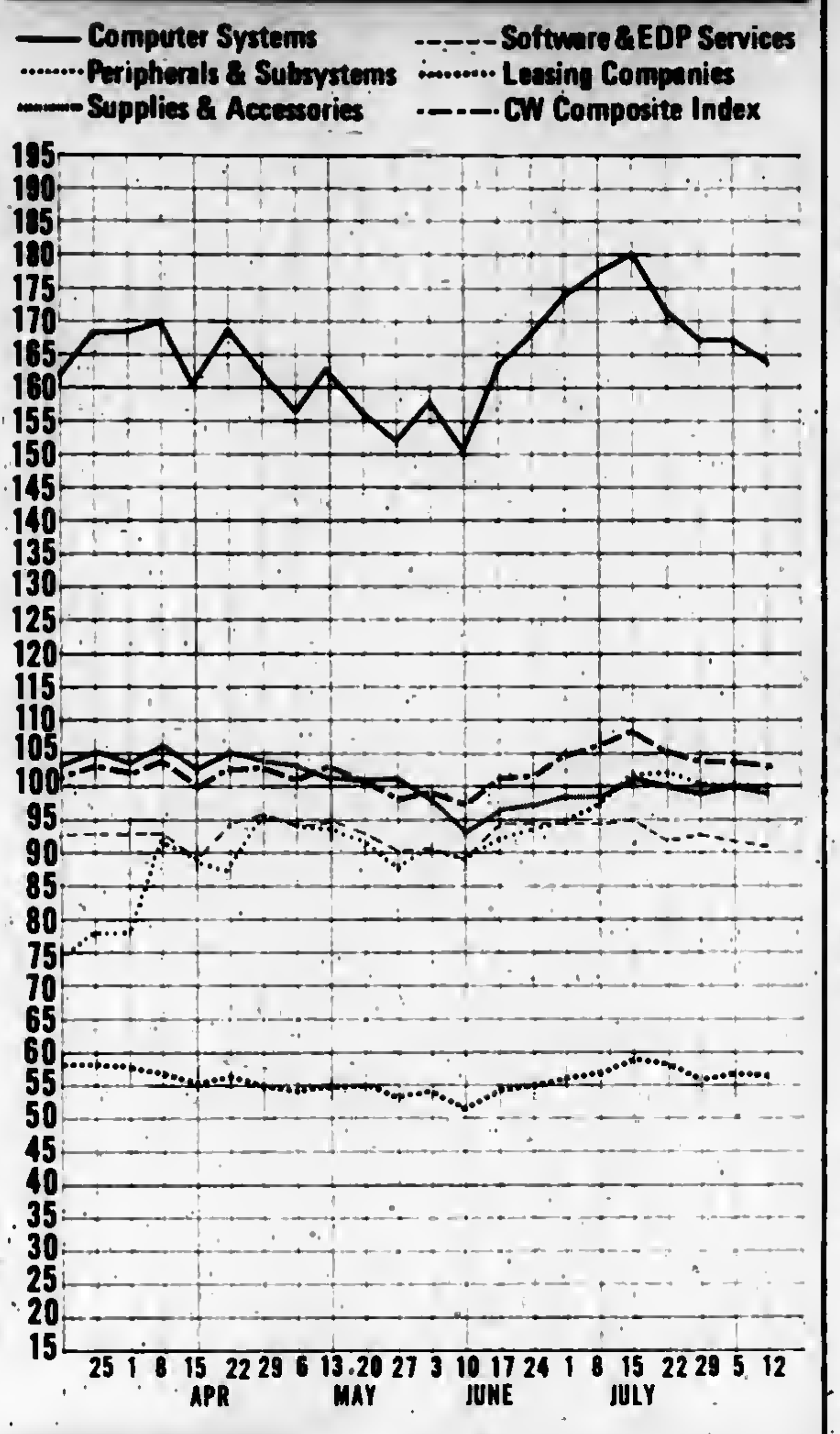

Earnings Reports

DATA GENERAL
Three Months Ended June 5

	1976	1975
Shr Ernd	$.48	$.35
Revenue	39,624,000	24,873,000
Earnings	4,621,000	2,915,000
9 Mo Shr	1.27	1.05
Revenue	102,736,000	73,631,000
Earnings	12,140,000	8,597,000

ANDERSON JACOBSON
Year Ended March 31

	1976	1975
Shr Ernd	$.35	$.27
Revenue	17,341,893	13,360,309
Earnings	864,431	663,906
3 Mo Shr	.09	.08
Revenue	4,570,760	3,929,146
Earnings	217,768	185,645

DATAPOINT
Three Months Ended March 31

	1976	1975
Shr Ernd	$.54	$.50
Revenue	19,506,000	12,287,000
Tax Cred	.....	336,000
Earnings	1,669,000	1,097,000
9 Mo Shr	1.61	1.48
Revenue	50,610,000	33,200,000
Tax Cred	495,000	975,000
Earnings	4,561,000	3,090,000

DATAPRODUCTS
Year Ended March 27

	1976	a1975
Shr Ernd	$.98	$.85
Revenue	85,085,000	85,938,000
Earnings	b7,076,000	5,818,000
3 Mo Shr	.30	.22
Revenue	23,397,000	20,709,000
Earnings	2,194,000	1,527,000

a-Restated to treat Data Card Corp. as unconsolidated subsidiary. b-Includes $615,152 gain from sale of Data Card subsidiary.

ENNIS BUSINESS FORMS
Three Months Ended May 31

	1976	1975
Shr Ernd	$.24	$.22
Revenue	14,854,532	13,401,468
Earnings	530,253	500,411

GENERAL AUTOMATION
Three Months Ended May 1

	1976	1975
Revenue	$14,518,000	$13,178,000
Loss	1,425,000	660,000
9 Mo Rev	47,804,000	41,392,000
Loss	1,232,000	2,540,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 11, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE AUG 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	95 1/2	+ 1/4	+0.2
O	COMPUTER AUTOMATION	10- 19	16	- 7/8	-5.1
N	CONTROL DATA CORP	18- 27	23 1/2	- 5/8	-2.5
N	DATA GENERAL CORP	40- 60	49 1/8	-1 7/8	-3.6
O	DATAPOINT CORP	24- 46	38 1/2	- 5/4	-1.9
O	DIGITAL COMP CONTROL	2- 7	5 3/8	- 1/4	-4.4
N	DIGITAL EQUIPMENT	138-181	168 1/4	-1 7/8	-1.1
N	ELECTRONIC ASSOC.	2- 5	2 7/8	- 1/8	-4.1
A	ELECTRONIC ENGINEER.	7- 16	9 1/4	- 3/4	-7.5
N	FOXBORO	28- 47	44 5/8	-2 1/4	-4.7
O	GENERAL AUTOMATION	5- 11	7 1/2	0	0.0
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	101 1/4	-5 1/2	-5.1
N	HONEYWELL INC	34- 56	46 5/8	-1 3/8	-2.8
N	IBM	227-280	277 3/8	+ 5/8	+0.2
O	MANAGEMENT ASSIST	1- 3	2 1/4	-	-2.7
O	MEMOREX	18- 33	25	-1 7/8	-6.9
O	MICRODATA CORP	10- 27	26 1/2	+ 1/2	+1.9
O	MODULAR COMPUTER SYS	5- 14	5 3/4	+ 1/4	+4.5
N	NCR	24- 36	34	- 1/8	-0.3
O	PRIME COMPUTER INC	4- 14	13 1/4	0	0.0
N	PERKIN-ELMER	19- 27	21 3/8	+ 5/8	+3.0
N	RAYTHEON CO	45- 66	63 3/8	+ 5/8	+0.5
N	SPERRY RAND	40- 52	47	+ 1/8	+0.2
O	SYCOR INC	20- 51	22 5/4	+1 1/4	+5.8
A	SYSTEMS ENG. LABS	6- 10	8 1/4	- 1/8	-1.4
N	VARIAN ASSOCIATES	13- 17	14 1/4	- 1/4	-1.7
A	WANG LABS.	11- 20	15 1/4	- 1/4	-1.6

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE AUG 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	0	0.0
A	COMMERCE GROUP CORP	2- 5	2 5/8	- 1/8	-4.5
A	COMPUTER INVSTRS GRP	1- 3	1 7/8	- 1/8	-6.2
M	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	+	+10.0
N	DPF INC	5- 8	7	- 1/4	-3.4
A	GREYHOUND COMPUTER	3- 8	7 1/8	0	0.0
N	ITEL	6- 15	15 1/4	- 1/8	-0.9
N	LEASCO CORP	6- 19	16 5/4	- 1/2	-2.8
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	0	0.0
A	PIONEER TEK CORP	6- 9	7 1/4	0	0.0
N	U.S. LEASING	7- 12	10 5/8	- 1/8	-1.1

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE AUG 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	0	0.0
O	ANACOMP INC.	8- 11	8 1/8	- 3/8	-4.4
A	APPLIED DATA RES.	2- 4	5 3/4	+ 1/8	+3.4
N	AUTOMATIC DATA PROC	17- 35	53 1/2	- 1/2	-1.4
O	COLEMAN AMERICAN COS	3- 6	2 5/4	- 1/4	-8.3
O	COMPUTER DIMENSIONS	5- 7	5 1/4	- 1/4	-4.5
O	COMP ELECTION SYSTMS	5- 9	5 3/4	- 1/4	-4.1
O	COMPUTER HORIZONS	1- 2	2	0	0.0
O	COMPUTER NETWORK	2- 6	3 1/4	- 1/4	-7.1
N	COMPUTER SCIENCES	4- 8	6 5/8	- 1/4	-3.7
O	COMPUTER TASK GROUP	1- 1	1 1/8	- 1/8	-10.0
O	COMPUTER USAGE	3- 6	2 7/8	+ 1/8	+4.5
O	COMSHARE	2- 9	6 1/2	- 1/4	-3.7
O	DATA DIMENSIONS INC	2- 4	3	0	0.0
O	DATATAB	1- 1	1 1/4	+ 1/4	+25.0
N	ELECTRONIC DATA SYS.	12- 16	16	+1 1/4	+8.4
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 5	1 1/2	- 1/4	-14.2
O	IPS COMPUTER MARKET.	1- 2	1	- 1/8	-11.1
O	KEANE ASSOCIATES	2- 4	3	- 5/8	-11.1
O	KEYDATA CORP.	2- 5	2 1/4	- 1/8	-5.2
O	LOGICON	4- 4	3 5/8	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/8	- 1/8	-5.5
A	NATIONAL CSS INC	13- 25	22 1/2	+ 7/8	+4.0
A	ON LINE SYSTEMS INC	18- 22	19 1/8	+ 1/8	+0.6
N	PLANNING RESEARCH	3- 5	3 5/8	+ 1/8	+3.5
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	0	0.0
O	REYNOLDS & REYNOLDS	13- 21	17 1/2	- 3/4	-4.1
O	SCIENTIFIC COMPUTERS	1- 1	5/8	+ 1/8	+25.0
O	TYMSHARE INC	19- 28	26 1/4	+ 1/4	+0.9
A	URS SYSTEMS	3- 5	4	+ 1/4	+6.6
N	WYLY CORP	2- 7	2 1/4	- 3/8	-14.2

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE AUG 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 15	9 5/8	- 5/8	-6.2
O	ADVANCED MEMORY SYS	4- 10	7 1/4	- 1/4	-3.5
N	AMPEX CORP	5- 10	8 5/8	0	0.0
O	ANDERSON JACOBSON	2- 4	2 3/4	+ 1/8	+4.7
O	APPLIED DIG DATA SYS	13- 25	22	0	0.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/2	+ 1/2	+6.2
A	BOLT, BERANEK & NEW	7- 11	9 5/8	0	0.0
N	BUNKER-RAMO	5- 10	8 1/4	- 5/8	-7.0
A	CALCOMP	4- 7	5 1/2	0	0.0
O	CAMBRIDGE MEMORIES	0- 6	5/4	- 1/8	-14.2
N	CENTRONICS DATA COMP	20- 36	34	+ 5/8	+1.8
O	CODEX CORP	22- 42	33	+ 1/2	+1.5
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 6	5 1/8	- 1/2	-8.8
O	COMPUTER CONSOLES	4- 7	5 3/4	+ 1/4	+4.5
A	COMPUTER EQUIPMENT	1- 3	1 1/2	- 3/8	-20.0
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	COMTEN	4- 9	7 5/4	- 1/4	-3.1
N	CONRAC CORP.	20- 25	22 1/2	- 5/8	-1.6
O	DATA ACCESS SYSTEMS	1- 4	5 1/4	0	0.0
O	DATA 100	7- 13	9	+ 3/8	+4.3
A	DATA PRODUCTS CORP	5- 15	15 3/4	- 1/4	-1.7
O	DATA TECHNOLOGY	1- 2	1 1/2	+ 1/8	+9.0
O	DATUM INC	1- 2	1 1/2	0	0.0
O	DECISION DATA COMPUT	1- 4	1 5/8	- 1/8	-7.1
O	DELTA DATA SYSTEMS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	3	0	0.0
O	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GENERAL COMPUTER SYS	1- 2	1 1/8	+ 1/8	+12.5
N	HAZELTINE CORP	4- 12	9 1/8	- 1/4	-2.6
N	HARRIS CORP	34- 54	54	+ 1/2	+0.9
A	INCOTERM CORP	9- 20	10	- 1/4	-2.4
O	INFOREX INC	3- 7	5 1/2	- 1/4	-6.6
O	INFORMATION INTL INC	10- 18	11 1/8	- 5/8	-5.2
O	INTEL CORP	60-109	62 1/2	-1 1/2	-2.3
A	LUNDY ELECTRONICS	4- 7	4	- 1/8	-3.0
O	MSI DATA CORP	3- 7	6 3/4	+ 1/8	+1.8
A	MILGO ELECTRONICS	15- 21	17	-2 3/8	-12.2
N	MOHAWK DATA SCI	3- 10	9 1/8	+ 1/4	+2.8
O	PENRIL CORP	1- 3	1 7/8	0	0.0
A	PERTEC CORP	3- 8	6 1/8	+ 5/8	+11.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTOR CORP	4- 6	5	0	0.0
O	RECOGNITION EQUIP	6- 11	8 1/4	0	0.0
N	SANDERS ASSOCIATES	6- 11	8 1/2	-1	-10.5
O	SCAN DATA	2- 4	2 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	12	- 1/2	-4.0
O	T BAR INC	5- 10	5 3/4	- 1/4	-4.1
O	TALLY CORP.	4- 6	4 1/2	- 1/4	-5.2
O	TEC INC	5- 5	5 3/4	0	0.0
N	TEKTRONIX INC	45- 67	64 3/4	- 1/4	-0.3
N	TELEX	2- 5	3 1/4	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 7/8	+ 1/8	+4.5

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE AUG 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/4	0	0.0
A	BARRY WRIGHT	6- 10	7 1/2	- 5/8	-4.7
O	CYBERNATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	29 1/8	- 5/8	-2.1
O	DUPLEX PRODUCTS INC	14- 24	14 7/8	+ 1/2	+3.4
N	ENNIS BUS. FORMS	6- 8	6 5/4	+ 1/8	+1.8
O	GRAHAM MAGNETICS	8- 13	9 1/2	- 1/2	-5.0
O	GRAPHIC CONTROLS	13- 19	15 1/2	0	0.0
N	3M COMPANY	53- 65	62	+2	+3.3
O	MOORE CORP LTD	40- 51	41 1/4	- 3/4	-1.7
N	NASHUA CORP	11- 18	17 1/8	- 1/4	-1.4
O	STANDARD REGISTER	15- 19	18 1/4	+ 1/2	+3.1
O	TAB PRODUCTS CO	5- 11	9	- 1/2	-5.2
N	UARCO	21- 25	21	- 1/2	-2.3
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Carter Against Bell Bill (Maybe)

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – There is not enough competition now in the communications business, Democratic Presidential contender Jimmy Carter recently told a consumer meeting sponsored by the Public Citizen Forum, a Ralph Nader organization.

Carter further stated that the pending Justice Department antitrust suit against AT&T is a good move in the right direction. The former governor added that the Bell-sponsored Consumer Communications Reform Act is not needed at this time.

Carter said he was personally familiar with instances which involved the right of competitive companies to provide telephone equipment within a motel, hotel or large business. He called these situations a legitimate reason for a place for competition.

The candidate said he had not been presented with any proof that there is too much competition within the communications industry now.

On the antitrust suit against AT&T, Carter said it seems to be a move in the right direction, although he is not familiar with all the details. At this time there seems to be no need for corrective legislation in the area of competition, he added.

The Carter comments were quoted in *Telecommunications Reports*, which included additional statements by the Democratic candidate that he had not been fully briefed on either the suit or the pending Bell-sponsored legislation.

A spokesman in Carter's Washington office said the comments made at the consumer meeting were not meant to be an official position; the candidate has not yet formed a final opinion on either issue, he added.

Other Washington sources said Carter's staff was being very hesitant on commenting and the candidate might have been "testing the water" with his statements at the consumer meeting.

Previously, at the Democratic National Convention, Carter had introduced Glen Watts, chief of the Communications Workers of America (CWA), on the night of his nomination. The CWA has strongly supported the Bell legislation since many of its members work for the Bell System.

In a recent speech before a consumer meeting in Cleveland, Watts backed the Reform Act and spoke out against competition.

The candidate said he planned to be a consumer advocate and to replace Ralph Nader as the top consumerist in the country. Industry sources said Carter privately assured the Nader people

(Continued on Page 4)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper — Second-class postage paid at Boston, Mass., and additional mailing offices

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Price: $15/year — August 23, 1976 — Vol. X, No. 34

NEWSPAPER

Trial Documents Show IBM Took Risk With 360 Line

By Edith Holmes
Of the CW Staff

NEW YORK – System 360 – its name was intended to denote IBM's "full circle" coverage of computing. IBM's "Brave New World."

This series of compatible mainframes that made IBM the unquestioned leader in the overall computer marketplace was called the "Brave New World" within the corporation's upper management because of the risk as well as the innovation it involved.

These are some of the facts the court hearing the trial of the government's antitrust case against IBM was given to understand through recent readings from the depositions of key IBM officials.

The Product Test Department of the Data Systems Division did not support the announcement of the 360 computers by their actual announcement date – April 7, 1964, according to Gilbert B. McCarter, who was manager of Product Test at the time.

Further testing was needed to confirm the models' technical suitability, McCarter said, adding this fact was made known to members of top management at a March 1964 meeting.

Noting the Model 40 was the furthest along in testing and the models 30 and 70 had not yet come under the scrutiny of Product Test, he stated testing of the 360 CPUs would require another three to six months.

McCarter said he couldn't remember

(Continued on Page 4)

IBM Hikes Upkeep on DPD Gear

By Nancy French
Of the CW Staff

WHITE PLAINS, N.Y. – Users of IBM equipment will pay higher contract maintenance bills on about one-third of the equipment sold by the mainframer's Data Processing Division (DPD) as of Nov. 16, IBM announced last week.

In addition, hourly service rates for all of IBM's DPD and General Systems Division equipment as well as for systems engineering will be increased by 15% immediately.

Contract maintenance for 332 products, including GSD equipment and "newer" gear "first shipped" by DPD in the past 12 months, will not be affected, IBM said.

The changes in contract maintenance prices, which include four increases for every decrease, affect equipment across the board – CPUs, disk and tape drives, terminals, printers, communications controllers and card reader/punches.

All models and some features of the 370/115-0 and 115-2 CPU will increase 5% and all models and some features of the 370/125-0 and 125-2 CPU will increase by 10%, an IBM spokesman said.

In the 360 line, 10% increases were

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Amdahl or IBM? Tennessee Can't Decide

By Toni Wiseman
Of the CW Staff

NASHVILLE, Tenn. – With IBM proponents in one corner squaring off against Amdahl advocates in the other, no one is sure what the outcome of the state of Tennessee match will be – a bout which may well be called on a RFP technicality.

The atmosphere surrounding the acquisition of a new central processor for the state's DP center has been alternately called "a discussion," "a controversy," "a free-for-all," "a near shoot-out" and "a prime example of political favoritism."

The issues in this matter include IBM vs. Amdahl, backup insurance vs. throughput and short-term vs. long-term plans. State house observers have noted that Republican vs. Democrat is also an issue in this election year.

"Our DP equipment, on a CPU basis, was created under a Republican administration and the legislature is Democratic," an observer stated. "Since the first machine went in, equipment has been added on an open-ended basis and they've been adding IBM on and on."

The state DP center currently has an IBM 370/158, 370/155 and 360/50. At press time, a legislative DP committee had recommended the state purchase an Amdahl system. The Department of Finance and Administration, however, has the last say and no decision is expected for the next two weeks.

When the DP center found it was quickly running out of computing power and was faced with two large systems coming on-line in the next few months, requests for proposals (RFPs) were issued to vendors on the state's list of prequalified bidders.

Of the seven or eight bids which were returned, three were qualified, according to William Jones, commissioner of finance. These included a used 370/158 from Federal Leasing, a new 370/158 from IBM and an Amdahl 470V/6.

The bids were then reviewed by the legislative DP committee which consists of the chairmen of the Finance Ways and Means committees of the House and Senate, the chairman of the Fiscal Review Committee, the state auditor and the state treasurer.

Amdahl Wins Vote

Based on a price/performance evaluation, the committee recommended acquisition of the Amdahl by a vote of 4-0.

"We found that Amdahl was the lowest responsible, qualified bidder," according to Don Morton, executive director of the Fiscal Review Committee. "And our statutes clearly provide for us to consider price/performance as a relevant factor in a bid."

While the DP center knew it needed more computing power, it also felt it needed backup ability for crucial applications such as law enforcement, Jones said. Therefore, the bid was for a second CPU

(Continued on Page 2)

Revamp of New York City's DP Seen Saving Initial $5 Million

By Catherine Arnst
Of the CW Staff

NEW YORK – Debt-ridden New York City could save as much as $5 million in the short run if it consolidated and overhauled its DP operations, a report issued late last month told the mayor.

The study, conducted by the DP Task Force of the mayor's Management Advisory Board, cited the lack of a focal point for citywide DP activities, underutilization of present systems and severe shortage of qualified DP personnel as the major problems with this city's computer operation.

"The first and most important action the city should take is to establish a Data Processing Plans and Control Unit" to coordinate its computer activities, the report recommended.

Besides the $5 million in the short run, further savings could be realized over the long run "by selectively reactivating some of the developmental projects which have been halted by the fiscal crisis," the task force suggested.

The Management Advisory Board was established by Mayor Abraham Beame following criticism of the city's fiscal practices by Treasury Secretary William E. Simon. One of the board's first assignments was to study the city's $66.6 million computer operation.

Concurrent with the release of the report, Beame acted on the task force's

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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160

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50 cents a copy: $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

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POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160.

Updates Optimize IMS/VS, CICS/VS; Data Dictionary to Support DL/1 User

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. – IBM has announced enhancements to its Information Management System (IMS/VS) and Customer Information Control System (CICS/VS) data base/data communication (DB/DC) products.

The company has also introduced a DB/DC Data Dictionary for use with IMS/VS or with Data Language/1 under DOS/VS.

IMS/VS Version 1 Release 1.3, ready now, gives the 3790 communication system the capability to handle all valid IMS/VS transactions, IBM said.

Additional terminal support provides 3277 data stream compatibility and 3790 disk support through the 3790 batch controller function, the company added.

A Vtam-authorized path for IMS/VS users operating with Vtam terminal support under MVS decreases the number of instructions used under certain IMS/VS features, according to a spokesman.

Fewer instructions and less resource allocation contention are the twin goals for the separately priced Fast Path feature for the IMS/VS user. A cutback in the coding required for transaction processing, a reduction in the I/O operations for data base operations and increased parallel processing are all possible with Fast Path, IBM said.

A Multiple Systems Coupling (MSC) feature is expected to allow the user to decentralize and distribute his workload to multiple IMS/VS systems on multiple 370s – in uniprocessor, multi-processor or attached-processor configurations.

Planned availability for Fast Path for use with MVS is July 29, 1977; for use with VS1 and SVS, three months later. MSC will be available next month for use with VS1 and MVS, IBM noted.

IMS/VS Version 1 Release 3.0 costs $808/mo; the additional monthly license fees will be $1,250 for Fast Path and $875 for MSC.

CICS Enhancements

CICS/VS Version 1 Release 3.0, scheduled for distribution early next year, will include a high-performance option designed to provide support for high transaction rates for CICS/OS/VS users running on Multiple Virtual Storage (MVS), according to IBM.

Dynamic Transaction Backout will offer recovery of the data base and other transaction resources following the failure of any one transaction; the High Level Programming Interface will simplify Cobol and PL/I access to CICS/VS, the spokesman added.

Without going into specific details, he said "preassembled CICS/VS modules and tables which provide a system ready for use or easily customized at system generation or initialization time" would also be part of the enhanced package.

CICS/VS support of enhanced Vsam functions will include a facility for building and maintaining alternate indexes, permitting access to a single data set through multiple keys and a logical backward processing capability, he continued.

The update will also include extended support of the 3790 communications system and support, through Btam, for the 3660 supermarket and 3600 finance communication systems, IBM noted.

CICS/DOS/VS is expected to be available at the end of February for $475/mo. The CICS/OS/VS package will be ready two months later and cost $1,000/mo.

Data Dictionary

The DB/DC Data Dictionary set for release next month supports the data base administration function by storing, processing and reporting definitions or descriptions of data in the system and its use by the application programs, IBM explained.

Operating as an application program, the dictionary can be used on-line through an IBM 3270 CRT terminal under IMS/VS. The DL/1 version operates in batch mode only, the company said.

Users enter definitions of data resources through a dictionary command language or an interactive display facility. The definitions may include several types of data, including subject name, aliases, attributes, description, user data, cross-references and other relationship data.

The command language also supports maintenance and administrative use of the stored data definitions. Provisions are made for storing non-DL/1 data and user-unique data, enabling installations to integrate all their data definitions into one central dictionary, he said.

The dictionary will be available Sept. 3 at $580/mo for OS/VS users, $290/mo for DOS/VS shops.

All of the software packages included in IBM's announcement are classified as program products, with centralized maintenance and support, the vendor noted.

Tenn. at Odds on CPU Purchase

(Continued from Page 1)

which would be used in a multiprocessor (MP) configuration with the first, he said.

The pro-IBM and the pro-Amdahl factions "discussed" the issues at a "very heated" session.

The question of backup was a large point of contention, according to Morton, but the committee eventually decided "just to vote to purchase the Amdahl" and let the DP center decide whether to trade in the 370/158 at a later date.

Amdahl had bid to replace the 158, either using the older equipment as trade-in on the price or on a straight gross price basis, Morton said.

"If they [the DP center] decide to keep the IBM, the price of the Amdahl does shoot up, but even with the gross price based on everything we've been able to determine, on a price/performance basis Amdahl is still low bidder, even without the trade-in," he averred.

One side's argument that the Amdahl machine was new and as yet unproven, with only 15 installations, was countered by the argument these facts were known when the RFPs were issued and Amdahl was on the qualified bidder list.

"And besides, even though Amdahl is a new company, there is a lot of experience there in terms of people. Look at Dr. Amdahl himself," Morton said.

An argument that no Amdahl users are currently running a production IMS/VS system was shot down when three such shops were found to be running well.

Finally, it was argued that there is no known secondary market for Amdahl equipment.

"I agree, that's true," Morton said. "But I don't think you can presume that if it's as good a machine with all the technical features everyone says it has, that there won't be a secondary market in the future."

Jones feels the problem centers around an interpretation of the RFP. "The legislative committee is looking for a five-year plan in data processing. We're looking for a backup system," he said.

Noting that the Amdahl bid was not essentially for the same system as the other bids (those for a backup system), Jones opined that a new set of RFPs might have to be sent out if the bid is indeed for a replacement.

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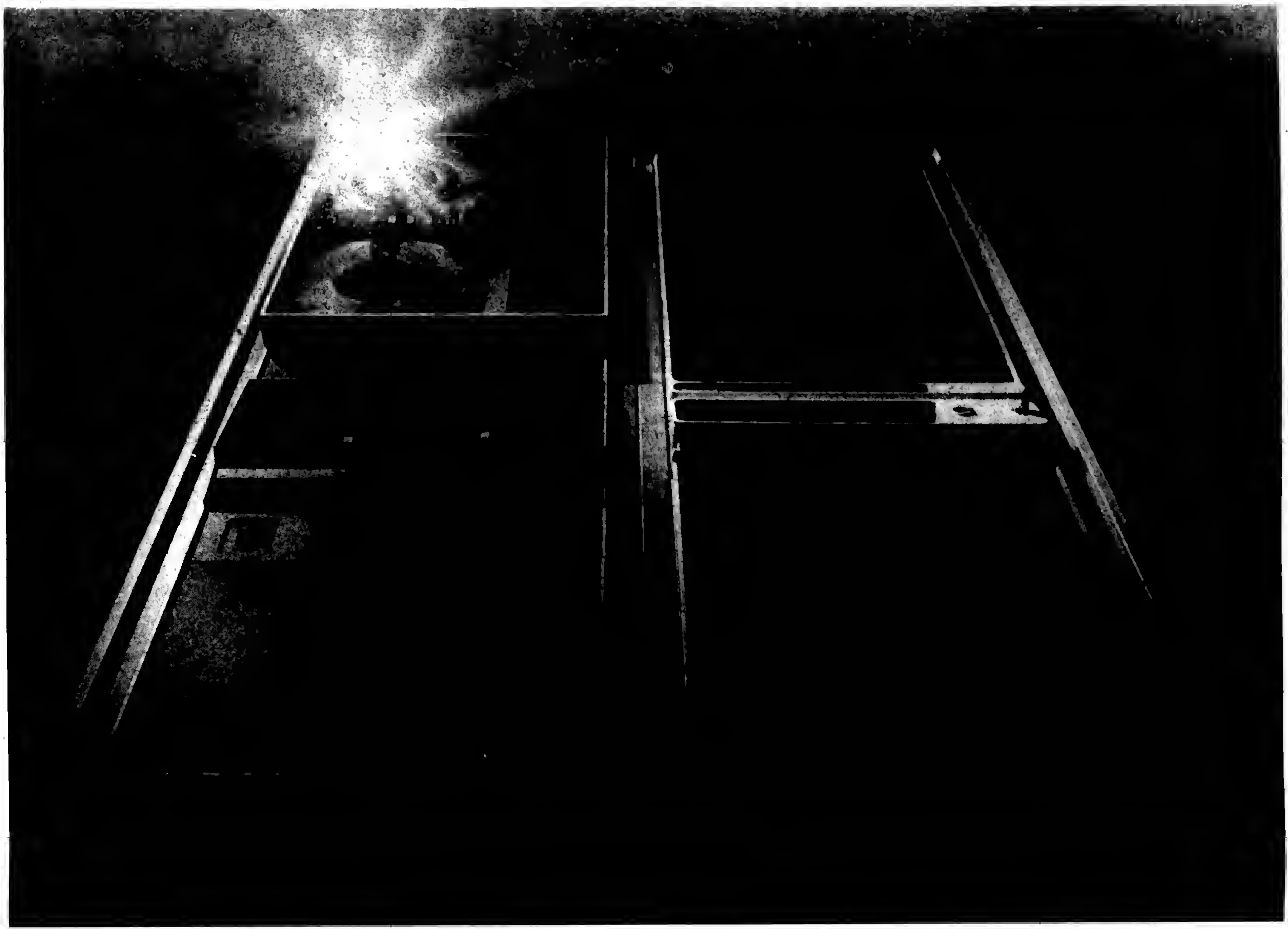

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Documents in U.S. vs. IBM Indicate

IBM 360/90 Designed to Save Face in Marketplace

By Edith Holmes
Of the CW Staff

NEW YORK – On Aug. 20, 1963, Dr. Harwood Kolsky, a senior engineer with IBM, wrote to the corporation's top management about his concern over IBM's position with respect to "Gold Chip" customers.

On Sept. 5, 1963, IBM's upper crust met at an executive conference held at Jenny Lake, Wyo. Among the topics discussed was IBM's potential loss of the prestigious large-scale scientific market to the upstart Control Data Corp. with its 6600.

On Sept. 9, 1963, Thomas J. Watson Jr., then chairman of the IBM board, sent Kolsky's analysis of the situation in "supercomputing" at the Atomic Energy Commission (AEC) laboratories – Los Alamos in particular – to many of those who attended the Jenny Lake meeting.

Commenting on Kolsky's tour of duty as a consultant at Los Alamos, Watson said, "Dr. Kolsky . . . had a unique opportunity to look at the IBM company from a customer point of view. What he saw should be of grave concern to all of us, for it is symptomatic of many of the things we discussed at the conference."

A member of the Advanced Systems Development Division (ASDD) at IBM's San Jose Laboratory, Kolsky said "the cold facts show that almost all of the AEC labs presently have competitive equipment installed or on order, much of it earmarked to replace IBM equipment."

Evidence in Trial

These 1963 exchanges between Kolsky and Watson and Watson and A.L. Williams, president of IBM at the time, have been revived here recently by the U.S. government as part of the evidence it is putting before the court hearing the trial of its antitrust suit against IBM.

Attorneys with the Justice Department plan to present some 140 documents over the next few weeks – documents the government claims will tell the story of how IBM came to recognize the need for a successor to its late 1950s supercomputer "Stretch."

The Kolsky documents summarize much of the IBM thinking, spread through many of the trial exhibits now being introduced into evidence, that led to the announcement of the 360/90 – a CPU the government calls "a classic fighting machine."

In his memo to management entitled "Some Comments on the AEC Computer Situation," Kolsky warned there had been internal meetings within the AEC computing community "at which a strong case has been made for all the laboratories to standardize on CDC equipment (the 3600 in particular).

"The arguments were mainly that this equipment is more modern and more nearly fits the standard scientific problems of the AEC than does the IBM product line, which they feel is now becoming too expensive and obsolete technologically," the senior engineer continued.

"The on-order position for the AEC at present shows that IBM has something like 10% of the machines on order, instead of the 70% which one would expect from our percent of the total market," he added.

Kolsky maintained that "only a bold stroke will save the day . . . in particular, the stroke of signing a contract with one of the AEC Laboratories for a Super-Stretch machine (meaning one at least five times Stretch performance on AEC problems)."

He tried to point out to management the fallacies contained in the view of the computing market as a pyramid with a few extremely large users, including the AEC laboratories, at the top.

From the pyramid perspective, "the market broadens down to include aerospace industries and other government-supported groups next, then the larger commercial users and, finally, layers of smaller and smaller commercial users," Kolsky stated, adding "the number of installations increases rapidly as one goes down in size.

"If one optimizes a computer design on the basis of income, it always turns out that a design aimed for the middle of the pyramid or the lower middle of the pyramid will result in far greater total income than one tailored either for the top, 'Gold Chip' customers, or for the bottom myriad of small potential users where the competition is quite fierce," he noted.

IBM's New Product Line (NPL), later called the System 360 series, was based on this market description, Kolsky observed. Even the notion of compatibility was oriented around total profit, and so around the middle of the pyramid.

"Unfortunately, profit is not the only thing which is important in this game," he added. "The two dozen or so 'Gold Chip' customers are really the fashion setters for thousands of smaller users throughout the industry."

While they may not represent a particularly profitable market, they do constitute an extremely influential market, Kolsky asserted.

He noted further that many commercial customers – even the smallest ones – needed to be able to identify themselves with the most far-reaching machines, despite the fact that their growth would never require systems with the most advanced capabilities.

"IBM, by not having a Stretch-like pacesetter in the market, has lost a great deal of this psychological advantage in the computing industry," Kolsky said.

The CDC 6600 had captured this advantage by captivating the large-scale scientific market, he stated. "The CDC 3600 is clearly going to be much more of a profit maker for CDC than the 6600 will be, yet [CDC is] willing to undertake this 6600 largely for the reason that it gives them the prestige of being the pace setter in the computing industry, and it will breed customers for their smaller machines."

If IBM was to save the AEC customers and maintain its name and equipment at other "Gold Chip" accounts, the corporation had to seek out a contract with at least one AEC laboratory "for a very high-speed computer having at least the performance of Stretch on AEC problems.

The computer Kolsky proposed that IBM build had to be a deliberate "state-of-the-art stretcher," a deliberate "competition-stopper," a deliberate "prestige-gainer," a deliberate "money-loser."

If calling the machine to be developed a "money-loser" was putting matters too strongly, Kolsky suggested it be termed "a shared-cost development for the benefit of the government."

If losing money on such a machine was a problem, mangement should remember "the indirect benefits to be gained will really make it very profitable," he added.

In other documents dealing with what was to become the 360/90, Watson repeatedly expressed his concern that IBM would lose its leadership position in the industry if it didn't make "the world's fastest computer." The IBM chairman of the board marvelled that CDC could produce the 6600 in only 18 months and in a laboratory with only 35 people.

The 6600 and the demands made by the "Gold Chip" accounts caused IBM to decide it had to have a machine more powerful than its NPL 501, later the 360/70, the IBM documents indicate.

IBM also had a "Project X" under way designed to outperform the CDC 6600, but its completion was too far off. Documents suggest IBM planned to have an interim machine, the 602, stopgap the performance range between the 360/70 and "Project X."

Later the 602 became the 604; and finally, by the 360 series announcement on April 7, 1964, the machine intended to rival the CDC 6600 was referred to inside IBM as the Model 90.

Papers Show IBM Took Deliberate Risk With 360

(Continued from Page 1)

whether the competitive environment was the reason behind the April 7, 1964 announcement of the 360 series. In February of that year, he had voiced his fears about the technical risks and exposure involved in trying to make all the 360 CPUs hardware-compatible with each other to the corporate processor manager, Dr. Frederick P. Brooks Jr.

In his memo to Brooks, McCarter also indicated top management was having its doubts. Brooks wrote back, "I'm not scared. You are . . . Go get a team of watchers and I'll tell them what questions to ask. Send in your auditors if you're not satisfied with my word. But do it quick."

To ensure there would be no slipups in the development of 360 hardware compatibility, Brooks sent his response to all the people working for him and added the message: "Make compatibility work." He indicated in his deposition, "My boys got the word."

Brooks also said he recommended the 360 be introduced that spring rather than later in the summer or fall of 1964. While he didn't know the reasons IBM eventually followed that course, the corporate processor manager, who later managed the development of the 360 operating system as well, added he believed the machines needed a year's lead time after announcement in order to educate users, customer engineers and management about them before their delivery.

Serious Consequences

Users uneducated in the device and its capabilities were likely to delay installations – with serious revenue consequences to IBM, Brooks noted.

In addition, he stated the 360 had been tested thoroughly enough to justify going ahead with the announcement and beginning pricing.

IBM had joint projects with users in which both parties had revealed proprietary information. For this reason as well, IBM needed to let everyone know what it was doing, Brooks said.

He had always advocated the 360 series be announced as such, particularly since the relationships between its pieces were complex. Piecemeal announcement, beginning with the Model 30, would also confuse and demoralize the field sales force, Brooks maintained.

The 360 series was more risky than "Stretch," IBM's joint project with the U.S. Bureau of Ships in the late 1950s to develop a "supercomputer," he said.

But the corporation was "doing the best" it could "as fast" as it could. There was no reason "to stick anything on a shelf while other skilled equipment developers moved forward," Brooks stated.

Carter Takes Stand Against Reform Act

(Continued from Page 1)

he opposed the Bell bill, designed to eliminate competition authorized by the Federal Communications Commission.

A source close to the Carter campaign in Atlanta said the candidate's "issues group" is working on the Reform Act and other pending legislation. Based on this analysis, Carter is expected to release a statement taking a stand on the Reform Act "within three weeks," the source said.

But campaign officials are not willing to issue a general policy on how Carter will deal with pending legislation, the source added.

"If he said that in a speech, then that is what he said. But there will be no further comment on this legislation," a spokesman at Carter headquarters in Atlanta said.

"There has been no further specific comment on this bill and there probably will not be," she added.

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WANG

N.Y. DP Revamp Seen Saving $5 Million in Short Run

(Continued from Page 1)

recommendation for a plans and control unit, which it termed "the key operational recommendation of this report," and appointed Dr. Kenneth M. King, dean of computer systems at City University, to head such a unit for six months.

Action on other recommendations in the report will be delayed until King's unit makes its report, a spokesman for the mayor's office said.

The task force's recommendation requiring the most radical action concerned personnel in the city's DP operations. "There is a severe shortage of qualified DP personnel due to layoffs, low morale and poor personnel practices. The city must make changes in Civil Service recruitment and training systems," the report emphasized.

During the task force's review, "it became obvious that the city's cutbacks in personnel were of almost universal concern to the people interviewed. Without exception, all installation directors stated that the lack of qualified personnel was severely impacting some portion of their operation," the report added.

Some of the suggestions made to alleviate this situation included "development of the best individual for a *specific* job, regardless of his position on the [Civil Service] list for a *type* of job"; development of an "effective means to transfer skilled employees between agencies"; and the design of mechanisms to hire individuals with critical skills which do not match the existing Civil Service structure.

These three recommendations "would be difficult to [implement] in the Civil Service system as it now stands," the mayor's spokesman said. "It would be difficult to scrap the Civil Service system and it is probably illegal."

The city is also under "a fairly strict hiring freeze," he added, making it even more difficult to change hiring practices.

The task force suggested that the development of new DP programs, which were virtually ended during the city's fiscal crisis, be reactivated to some extent. Specifically, it mentioned systems planned by the Housing Development Administration, Human Resources Administration and the Health and Hospitals Corp., which would result in reimbursements to the city of an estimated $44.6 million annually.

A side effect of reducing developmental efforts, the report added, "is the demoralization and possible loss of key development people [who] are not motivated by maintenance assignments."

Data entry tasks, which are currently contracted to private companies at a cost of $3 million to the city, were also examined by the task force, which recommended that the city initiate a pilot project in the operation of a centralized data entry service.

"It is felt that such a facility could offer services that would lead to significant improvements in the overall operating efficiency. Furthermore, the city would begin to acquire experience and expertise in the effective management of production- and control-oriented data entry," the report said.

IBM Ups Maintenance For DPD Equipment

(Continued from Page 1)

announced for the 360/30, 40 and 44, 15% increases were announced for the 360/50, 65, 67 and the 75.

Contract maintenance for the 360/91 was cut by 10%, IBM said.

Contract maintenance for most IBM terminals and their control units will also cost more. In the 3270 series, the 3271 and 3273 control units will cost users 15% more to maintain under contract, as will the 3275 CRT. Contract maintenance on the 3277 will increase by 10%.

Contract maintenance for the 3770 series of remote job entry terminals will be up 10%, IBM said. Those affected are the 3771, 3773, 3774, 3775 and 3776. The 3777 will not be affected.

Other terminals affected by a 15% increase in contract maintenance prices include the 2741 typewriter terminal, the 2250 graphics CRT, the 2260 CRT, the 3735 programmable buffered terminal and the 3767 and 3780 communications terminals.

Communications controllers affected by a 10% increase include the 3704 and the 3705-1. The 3705-2 will not be affected, IBM said.

While users of the 3330 disk drive will be unaffected, users of the 3340 and the 2314 will pay 15% more for contract maintenance, IBM said. Contract maintenance for the 2311 disk drive will increase by 10%, while service contracts for the 2312, 2313 and 2318 will go up 5%.

Contract maintenance rates for most tape drives will be up 15%, affecting users of models 2401, 2402, 2403, 2404, 2415 and 2420. Maintenance on the 3420 will increase 10%.

Rates for the 1403, 1404, 1443, 3211 and 1053 printers will be up 15%, while rates charged for the 3784 will increase by 10%. Service for the 2213 will cost 5% less.

The newer 3203 and 3800 printers will be unaffected, IBM said.

Contract maintenance on the 1402 and 2540 reader/punches will cost 15% more; maintenance on the 3525 reader will increase only 10% and 5% on the 3505 card punch, IBM said.

Hourly rates for daytime service calls not covered under maintenance contract will be raised 15% for General Systems Division products as well as DPD products, effective immediately, IBM said.

The rate for repair of Class 1 DPD equipment, such as key entry equipment and terminals, will increase from $33.25 to $38/hour.

Class III hourly maintenance rates for DPD equipment, including 360/370 central processors, will increase from $44.25 to $50.75, IBM said.

Hourly maintenance rates for Class II or General Systems Division equipment will rise from $39 to $44.75, IBM said.

Finally, systems engineering services previously billed at a rate of $39.50/hour will cost $45.25/hour.

Correction

In "HIS Planning Migration Option for Xerox CP-V Users" [CW, June 28], it was reported that no memory map hardware is presently available for Sigma 5 users.

Memory map capability is available for Sigma 5 users from Telefile Computer Products, Inc. of Irvine, Calif.

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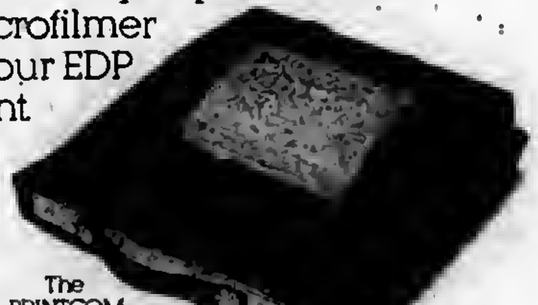

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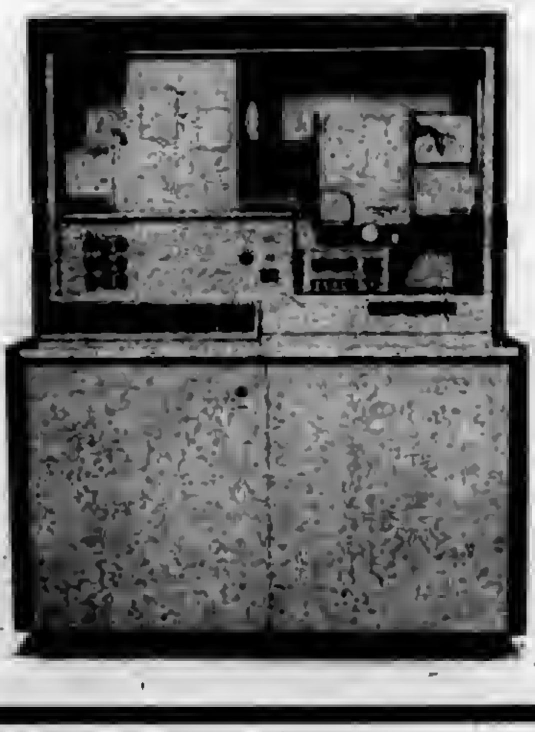

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N.Y. DP Revam

(Continued from Page 1)

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Justice Readying Attack on IBM 'Fighting Machines'

By Edith Holmes
Of the CW Staff

NEW YORK – Were they plain old – albeit novel and innovative – product announcements?

Or were they "fighting machines," paper tigers ferocious enough to check Control Data Corp. in the large-scale scientific market, Digital Equipment Corp. in the intermediate scientific market, General Electric (GE) in time-sharing and Honeywell across the board?

These are the central questions in the latest trial phase of the U.S. government's antitrust case against IBM. Attorneys with the Justice Department will seek to prove IBM's initial announcements of the 360 line and, later, its 360/90, 360/44 and 360/67 represented marketplace conduct intended to buttress, and in some instances to create, a monopoly position in the computer industry.

For the next two to three months, the government will present the "fighting machines" or "product announcements" portion of its suit with as many as 1,000 internal IBM documents, the depositions of six IBM officials and one live witness – CDC's Robert D. Schmidt.

Meanwhile, IBM counsel will stress that the firm did not violate federal law, that these products were typical in terms of their technical preparedness at announcement time.

All these machines were expected to be profitable when announced, and one has only to look at the success of IBM's competition to know the last result these machines achieved was the maintenance of a monopoly position, the corporation told the court in its opening statement at the beginning of the trial a year ago last May.

In its opening statement, the government defined "fighting machines" as "selected computer products announced and introduced by IBM in markets or segments of markets in which competing computer firms threatened to achieve unusual success, thereby threatening IBM's overall monopoly position."

These machines were characterized by "precipitous or accelerated announcement" to customers before they were put through the traditional IBM testing and review procedures and when IBM management knew substantial technical risks were still present, the Justice Department said at the time.

In addition, fighting machines generally carry with them "unusually low profit expectations," the government added.

Justice Department attorneys will try to pin down just what the technical readiness of the 360 as a whole and of its models 90, 44 and 67 was at the time of announcement, what their profitability projections were and why IBM chose to introduce the machines when it did.

Origins of 360 Series

The 360 line had its origins in the Spread Committee report of December 1961, according to a stipulation, or agreement, between IBM and the government. Consisting of top technical and engineering IBMers, that committee recommended that IBM's next computer line be a family of six compatible machines.

The Spread Committee anticipated public announcement of the first models of the new product line in 1964. The machines were to have advanced technology and this, coupled with the novel compatibility feature, led the committee to recommend the entire line undergo thorough testing, Justice said.

By June of 1963, the schedule for the 360 series called for staggered announcements from 1964 to March 1965. But the strength of its competitors–and particularly Honeywell–caused IBM to disclose details about the 360 to selected users and accelerate its announcement to April 1964, the government has contended the documents will show.

Timing of Announcement

In proving premature announcement, the Justice Department will rely heavily on such facts as the absence of the support of the product test departments involved in the announcement, the early stage of testing of most of the processors and the lack of performance specifications for the basic software, which hadn't even entered product test.

Government attorneys told the court they want to show announcement timing was the result of marketing decisions. The April 7, 1964 announcement of the 360 series was intended to create a competitive jolt and prevent the threatened competition from making any inroads into IBM's established market position, according to Justice attorneys.

IBM hoped to and succeeded in discouraging customers from switching to competitors' equipment, despite significant slippage problems with 360 technology and deliveries, the Justice Department said.

'Prime Example'

Calling the 360/90 "a prime example of a fighting machine," the government intends to show this "supercomputer" was announced and then developed in response to the CDC 6600 which threatened to capture all large-scale scientific computing accounts in the summer of 1963.

When the Model 90 was announced, such a machine didn't even exist and its basic parameters had not yet been defined. In addition, the government plans to prove the 90 "was a substantial money loser," squandering more than $100 million.

IBM documents will show the 360/44 was designed to compete in the intermediate scientific market and its premature announcement was aimed to prevent competitors from establishing a foothold in the scientific marketplace, Justice said.

As with the Model 90, profit expectations for the Model 44 were low in comparison with the 30% of total revenue standard set for the rest of the 360 line, the government contended.

Initially, the Model 44 competed with CDC and Scientific Data Systems (SDS), although it later locked horns with machines from Digital Equipment Corp.

Described by the government as a machine "with the performance of the 360/50 and the price tag of the 360/30," the Model 44 was not completely compatible with the rest of the 360 line, it was not supported by product test at the time of its announcement and, after two years in the marketplace, it still was not really marketable and represented a several million dollar loss to IBM.

An afterthought to the 360, the Model 67 was a time-sharing machine designed to meet GE in this area of computing, the government said.

GE's work with MIT and its contract with Bell Labs caused IBM to fear it would lose similar "prestige" or "blue chip" accounts elsewhere; when the 67 was announced in August 1965, it had already been disclosed to some 100 customers, the government noted.

Once again, IBM's programming and product test operations did not agree the machine was ready for announcement, and low profit projections later became financial disaster on the order of a $100 million loss, according to the Justice Department.

"Only a company with the monopoly power of IBM could stand the losses resulting from programs like the Model 90 and the models 44 and 67," one attorney stated during the government's opening statement.

For its part, IBM counsel will try to prove the insignificance of the models 44, 67 and 90 in terms of the larger 360 series success.

In addition, the defense has stressed the success of the competition–particularly CDC and SDS–in the markets they pursued.

Referring to the original Spread Committee report, IBM will seek to show the 360 announcement was not premature.

Though product test was not in a position to make a statement of "routine" support in time for the April 7 announcement, every other department was, according to IBM.

In addition, it was not a function of product test at the time to determine whether a product should be released, the corporation will stress.

All these "so-called fighting machines" were expected to be profitable, the defense will assert, adding there are many ways to calculate profitability.

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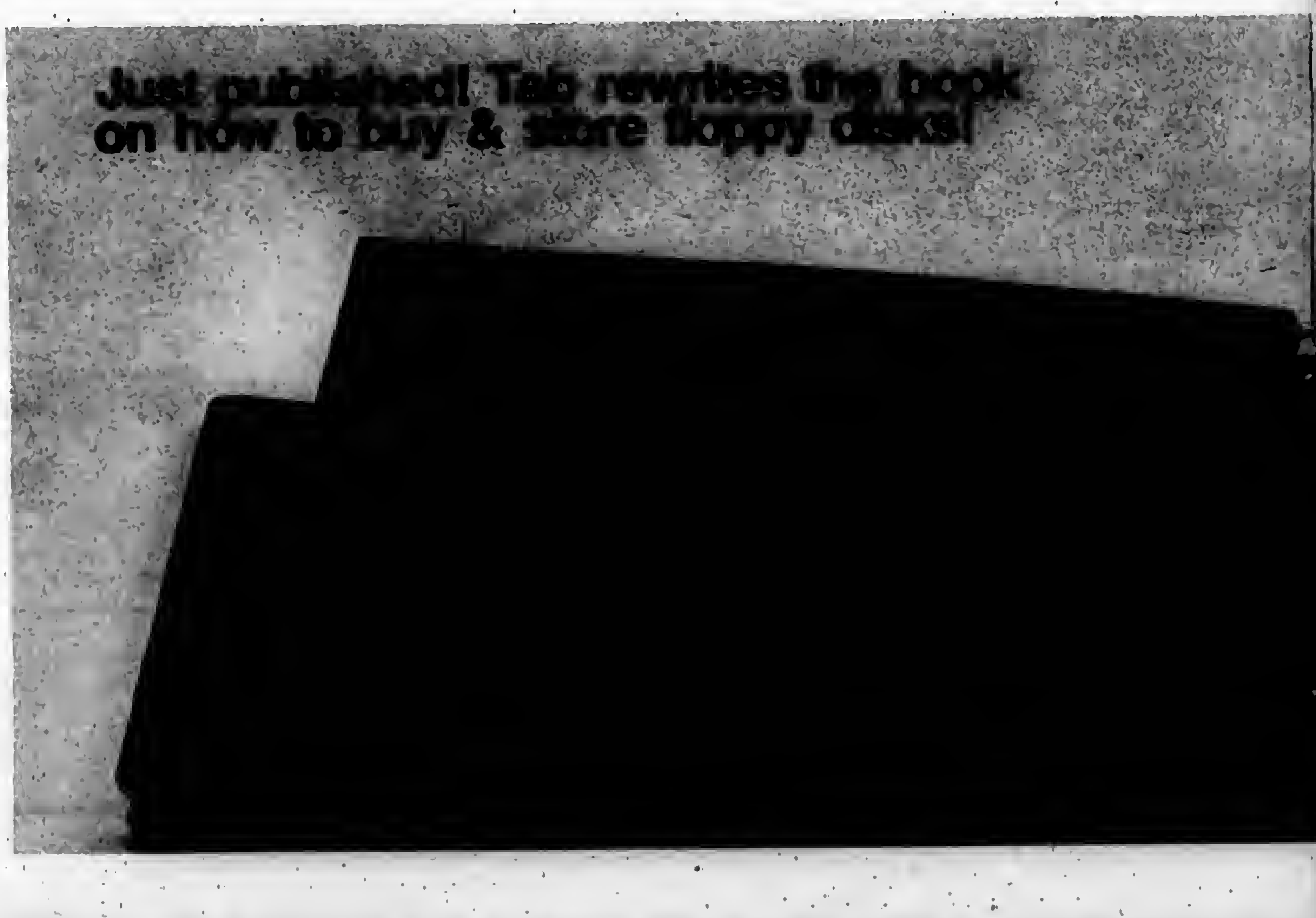

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EFT Gaining Ground

Bank Expanding Market Services

By Toni Wiseman
Of the CW Staff

LOS ANGELES – Electronic funds transfer (EFT) is becoming more of a daily routine for shoppers here.

California Federal Savings and Loan Association has been authorized by the Federal Home Loan Bank Board to install remote service units (RSUs) in as many as 154 Von's Grocery Co. and Hughes Markets, Inc. supermarkets.

California Federal is currently operating a single RSU at each of seven Von's and four Hughes markets in the Los Angeles metropolitan area, enabling bank customers to deposit funds into their savings accounts, make withdrawals and cash checks.

Expansion to seven more stores is planned for this year, according to Bob Weber, California Federal vice-president.

The operation centers around Addressograph-Multigraph Amcat 1 and Amcat 3 terminals hooked up to a Digital Computer Controls, Inc. (DCC) minicomputer front end.

The DCC mini is connected to a Univac 494 which operates as the host CPU, Weber said.

Additional Services

The federal loan board's approval will make it possible for California Federal to offer a number of additional services through the RSUs, Weber noted. These include direct payment for supermarket purchases, payment of utility bills, purchase of money orders and acceptance of loan payments from California Federal borrowers.

Currently, however, the only new service is direct payment for groceries; the amount of the customer's supermarket purchase is deducted from his savings account and transferred to the market's account, Weber said.

Lessens Stores' Risks

The grocery stores are enthusiastic about the program since it reduces both their risk and the amount of cash they must keep on hand, Weber said.

Under the conventional check-cashing system used by many stores in which each chain issues its own courtesy card, the supermarket is liable for bad checks, he said. California Federal now takes that risk.

In terms of cash flow, most supermarkets today cash checks equal to the amount of their sales, he said. But with the California Federal scheme, there is a reduced need for cash since customers can simply deposit their pay checks at the terminal and debit their accounts for their grocery purchases.

California Federal customers who want to use the supermarket RSUs must open a special "California Money" savings account. It is basically an "electronic transaction account," Weber said, or a statement rather than passbook type of account.

Money Card Used

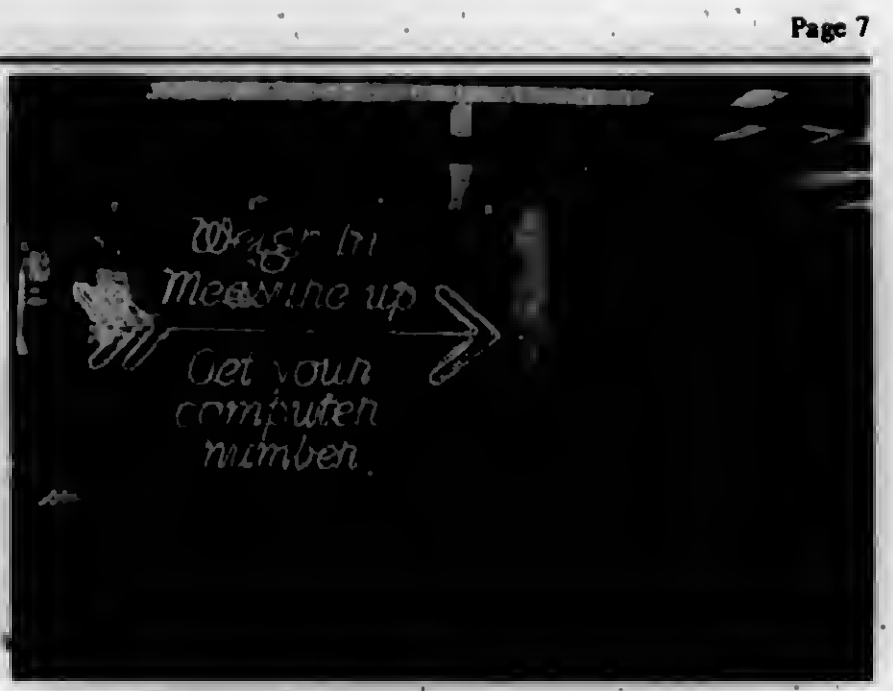
To date, each of the participating Von's and Hughes markets are equipped with a single RSU which is located at either the customer service desk or the liquor department. In the next phase, however, two of the seven markets involved will have RSUs at every checkout stand.

To use the system, a California Federal customer first presents his plastic California Money card to the supermarket employee operating the RSU. If he is making a deposit or withdrawal, the customer fills out a form similar to a credit card receipt.

The supermarket employee inserts the card and form into the RSU and presses the appropriate keys on the Amcat keyboard, recording the transaction on both the form and at the California Federal computer.

To ensure confidentiality for all transactions, the plastic card is magnetically encoded with the customer's account number and the name of the branch where the account is maintained.

In addition, to complete a transaction, the customer must key in his personal identification number through a small keyboard directly in front of him. The number consists of a four-digit or four-letter code selected by and known only to the customer.



Thought for Food

CHICAGO – Visitors to the "Food For Life" exhibit at the Museum of Science and Industry here can find out their recommended daily allowances (RDA) of vitamins, proteins and minerals with the help of a minicomputer.

One of the exhibit sections features menu selection. A glass-enclosed cabinet is equipped with rotating trays of food from which a visitor makes a selection. After the entire meal has been chosen, the mini analyzes the meal's nutritional value; data on how the meal meets the RDA required by the individual is displayed on a CRT.

System hardware consists of a 64K Digital Equipment Corp. PDP-11/40 and two RK05 disks for additional data storage. There are nine 16-digit keypads and 11 CRTs throughout the display area.

TI Security Based on Voice Verification

By Catherine Arnst
Of the CW Staff

BOSTON – A security system using voice verification has been in use for the past year and a half at Texas Instruments, Inc. (TI) in Dallas, Texas.

It is "the first completely automatic system based upon a personal attribute to provide high operational security," TI's Dr. George R. Doddington claimed at a recent conference here.

Verification is based on a four-word utterance randomly selected from a set of 16 monosyllabic words. A sequential decision strategy is used which requires one to four utterances for verification.

The average number of utterances required is 1.35 and the average verification time is 5.6 seconds, which includes both voice prompting and user response, Doddington noted.

There are three major sources of verification errors when using a voice identity system – variations in speech by the same speaker, similarities in the speech of different speakers and problems in measurement, comparison and time registration, Doddington said.

To overcome these problems, each verification system user at TI must generate reference speech data and parameter estimates during an enrollment session, which also accustoms the speaker to the verification procedures.

Five sets of utterances are required in the enrollment session. The first set is used to define initial reference patterns for each of the 16 words and the remaining four replications of each word are used to refine the speech reference data and to estimate speaker parameters, Doddington said.

"A trade-off will often be necessary between verification performance and verification time," he added.

Seven components comprise TI's speaker verification system. They include an identification keyboard or badge readers to identify the user and select the correct speech reference file; an 8-bit digital-to-analog converter for voice response which gives instructions to the user; a microphone and digital filter bank to provide the frequency analysis of the speech signal; a minicomputer which provides all speaker verification and system control functions; a moving-head disk for speech reference data storage; a control teleprinter for operator interaction; and a control line/sense line interface which enforces the verification decision and fully automates the entry control.

Entry to TI's Corporate Information Center is controlled by a 4-foor by 5-foot booth whose doors are monitored and controlled by computer. The verification terminal in the control booth includes both a microphone and a badge reader.

The entire floor of the booth also serves as a weight scale and, during the verification process, the weight of each user is recorded along with his speech data.

Initial user acceptance of the verification system was gained gradually over a two- to three-month period, Doddington said.

Widespread Use Still in Future

Chicago Schools' Success With CAI Doesn't Alter View

J. Daniel Couger On *Education*

In response to my column on the disappointing cost of computer-assisted Instruction (CAI) [CW, Jan. 12], I received a letter describing the approach used by the Chicago public school system. It's providing good results and will be summarized below. After you've read about the Chicago system, we'll decide if it proves the cost-effectiveness of CAI.

In his letter, Lawrence Rosenthal, director of the Bureau of Computer-Based Instructional Systems, explained the Chicago public schools have been operating a CAI program for elementary school students since 1971.

The curricular areas serviced include reading, language arts and mathematics. The program is funded by ESEA Title I and is directed toward drill-and-practice learning experiences for students who are underachievers in reading.

Chicago began its program with 105 CRTs and seven printing terminals located in seven elementary schools. The program now includes 53 elementary schools which are equipped with 15 CRTs and one printing terminal. Students interact with the system on a daily basis via the CRT devices.

The printing terminals are used to produce student progress reports for teachers and to permit teacher aides to perform registration and other housekeeping activities related to the program. Terminals are multiplexed over high-speed telephone lines and connected to a single central computer system located in the Department of Systems Analysis and Data Processing.

The operating cost for this program is $43/year per student per curriculum, according to Rosenthal. Students receive drill work in reading and one other curriculum area. The second curriculum area is determined by the classroom teacher and is based upon the greatest need of the student.

The $43/year cost includes not only the hardware, but also the salaries of staff involved in the program and one paraprofessional who is assigned to each school. This represents the total operating cost with the exception of lighting and air conditioning.

In his letter, Rosenthal questioned my earlier statements about the cost-effectiveness of CAI:

"I believe your conclusion that instruction via computer will not be feasible until the early 1980s is not justified because it appears to be based upon a review of two applications, the Plato and Ticcit systems.

"Our experience in Chicago and in other school districts has, in fact, made CAI an operational reality at the elementary and secondary levels of education."

How Good Impact?

The natural question arising from Rosenthal's letter is, "What is the impact?" Students are on the terminal only 20 minutes daily, according to Ritta Cooney, Rosenthal's assistant.

In addition, less than one quarter of the students in each school (only grades 4 through 8) have access to the system. Nor were development costs included in the $43 figure.

The principles in developing the Chicago CAI system are to be commended. It's a good start.

However, the Chicago approach does not warrant a change in the views stated in my earlier column discussing the costs of Plato and Ticcit: "One must conclude that it will be at least the early 1980s before *primary* instruction is feasible."

Perhaps Rosenthal interpreted "primary" to mean "basic" type of instruction. It was originally intended to mean "principal.".

After six years of operation, only 20 minutes of a full training schedule are provided by CAI in the Chicago system.

I'm not happy with my conclusion, but it still appears accurate.

Couger is professor of computer and management science at the University of Colorado.

Rutgers Researchers Using 360/67 To Study Role of Saints in History

By Ann Dooley
Of the CW Staff

NEW BRUNSWICK, N.J. – The saints are marching in here – to the tune of a computer which is being used to examine the role of saints in history, according to Dr. Donald Weinstein and Dr. Rudolph Bell of Rutgers University.

Using an IBM 360/67 for statistical analysis and data retrieval, information on 680 saints is being used to study "patterns of variation and changes of saintly origins, activity and reputation," Weinstein said.

Weinstein's and Bell's work, which they expect will continue for several years, will study 50% of the saints canonized or beatified by the Catholic Church between 1000 A.D. and 1700 A.D., or from the Middle Ages to the Counter-Reformation.

They plan to study 1,500 saints. As historians, they are not questioning the accuracy or the belief in saints, they said, but instead are studying the saints' lives within a broad social context.

The idea consists of categories such as birth, social background, early influences and basis for reputation of saintliness, such as preaching, helping the poor, founding of religious movements, miracle working, martyrdom and signs and miracles during and after death.

Coded Variables

The material is coded using 65 variables. Under the code word of MARRIED, for example, 0 was assigned to "never married," I to "married twice" and 8 to "never married, but had children."

Some codes were more difficult to assign values to because of their vague meanings, the researchers said. These included "influence of visions," or VISINFL.

Codes like AFTADEAD (miracles immediately after death) and SELFMORT as "big promoter of flagellants" became fairly arbitrary because of their vague accounts, according to Bell.

At one point, an appendage to the breakdown of data about one saint was discovered to have read, "I wish we had a separate category for leper kissers."

By correlating the attributes of saintliness, such as visions, it can be shown how important each was to the saint and to the society of the time, according to Weinstein. Through the use of the 360/67, information about one aspect of the material – such as characteristics about women saints – can be accumulated quickly, he added.

Role Models

By examining a community's perceptions of saints, Weinstein and Bell hope to prove saints were used as role models and innovators of social change and not just as a reflection of the current societal views.

"The cult of saints seems to us a marvelous index of changes in popular piety, and it enables us to relate changes in religious practices to changes in society," Weinstein said.

Some of the saints which they have examined are Thomas Becket, Anthony of Padua, St. Margaret of Scotland and Francis of Assisi.

AAA Offering Mediation In Contract Disputes

NEW YORK – In an effort to get technology-based disputes out of the courts, the American Arbitration Association (AAA) is offering its services to help resolve the growing number of contractual disagreements between computer equipment and services vendors and their customers.

Arbitration, which involves settlement of a dispute through the mediation of an impartial third party, is an American tradition that dates back to the settlement of George Washington's will, according to an AAA spokesman.

A nonprofit organization, the AAA does its work by calling in panels of experts to help the parties sort out issues and prioritize demands in commercial disagreements of all kinds, he said.

The AAA is located at 140 West 50th St., New York, N.Y. 10020.

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Editorials

Dealing With a Reality

The recent International Conference on Computer Communication in Toronto demonstrated that a multinational common user data communications network is a technical reality.

But as the accessibility to data is being regulated in individual countries, the new and perhaps greater threat of international unauthorized access has reared its ugly head. The business community has become graphically aware of multinational corporations that operate just beyond the law of any nation to violate the laws of many nations.

A similar threat now exists from data pirates who literally "commandeer" data in midstream and manipulate it for their private gain in an extraterritorial data haven.

It is doubtful that data communications users can wait for international legal conventions to safeguard their transmissions. Existing copyright and other international agreements took many years to evolve and still are not subscribed to in a uniform manner by all nations.

The user will have to be aware his data is subject to compromise. The steps necessary to guard against such compromise may become more technically complex on an international scale when data is transmitted over multiple public packet-switched nets or via multiple-hop satellite links.

Hopefully the transnational common carriers will work with users to develop a system of uniform safeguards to protect the integrity of data that will soon be traveling around the world.

The carriers may have their own political motives on the types of services to be provided to users and the amount of control put in the hands of customers. But these same carriers have a good record of "carrying the mail" once they decide to provide a service.

Carriers and users may offer the best alliance against the potential data pirate who embarks on intentional misuse of sensitive information. Perhaps the groundwork for beginning such a dialogue could be instituted during the International Federation of Information Processing (Ifip) congress next year in Toronto.

Making the Connection

Over the years, and quite regularly over the past few months, we have tried to cover the nonhardware/nonsoftware aspects of a DP installation.

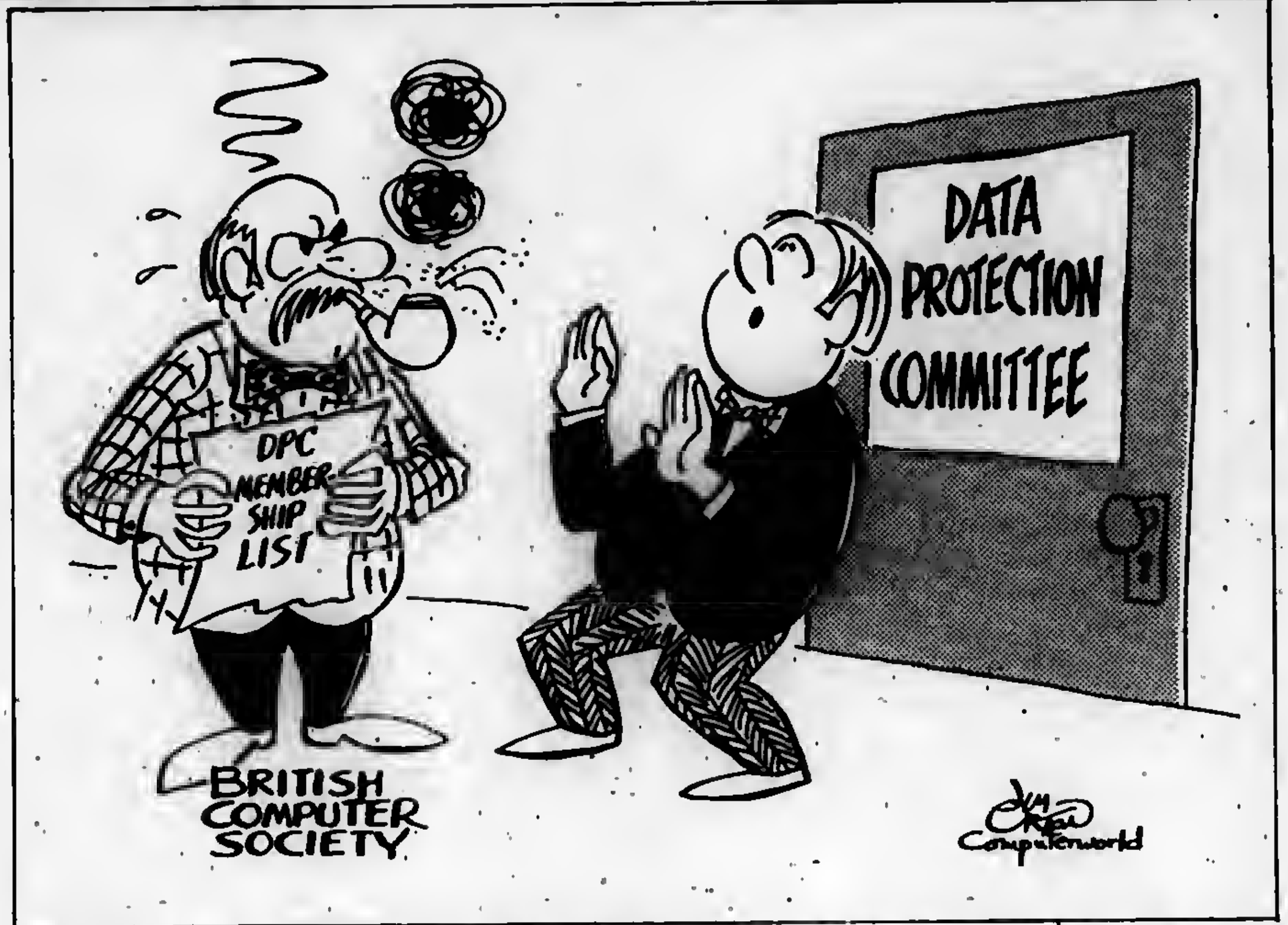
Our recent use of the term "Peopleware" came close to suggesting what we wanted to cover but many — ourselves included — weren't really happy with that label. The word itself seemed to dehumanize exactly that part of the DP scene we wanted to personalize.

With this issue we recognize, finally, that "The Human Connection" is, very simply, what we want to highlight. And so, on page 17, we've started using that label on articles related to the people involved in DP systems.

We want to focus on ideas, tools and events linked to selecting, training, career pathing, motivating and managing people with an eye to improving their efficiency, effectiveness and attitudes. This week's issue includes the first of Jack Stone's columns based on letters from readers.

In later weeks we will add coverage of seminars, training products, profiles of how users manage their personnel and what personnel think of that management as well as reports of discussions at technical conferences.

Reader contributions — leads, complete articles, reactions to previous stories, anything related to people within DP — are welcomed.



'Of Course We Didn't Pick Our Members at Random — We Might Have Inadvertently Selected a Computer *Person!'*

Letters to the Editor

Government PV Formula Assumes Income Equal to Cost to Borrow

Regarding Jerome G. Ganci's letter [CW, July 26] on the article "Using Government Formula Helps Dealers Set Prices" [CW, June 7], the present-value (PV) method of analysis assumes capital spent will be used to produce income at a rate equal to, not higher than, the cost to borrow.

Whether the funds are acquired from internal or external sources is immaterial to the analysis. No matter what the source, there is a cost associated with the acquisition of capital. This cost is either explicitly or implicitly recognized.

If the funds are from external sources, there is an explicit cost in the interest rate. If they are internally generated funds, the costs are associated with delaying the return of the capital to the residual owners.

The argument that "the government is not in the business of making profit, (therefore) its internal rate of return must be negative" was fallacious. The government *is* in the business of making a "profit." But this profit is not the profit of the marketplace; it is the "profit" of the public-service sector.

The economics of the public-service sector are different from the economics of the marketplace, but this does not necessarily repudiate the usefulness of PV analysis.

While Ganci's comment that the PV analysis method outlined in the article "was naive and bordered on the incompetent" may be true, the method is certainly better than totally ignoring the time value of money. It is at least a start toward a more sophisticated financial analysis.

Richard Courcy

Norwich, Conn.

PV Criteria Not Misleading

The government evaluation criteria is not as complicated or misleading as Jerome G. Ganci implied in his letter to the editor of July 26. As Ganci explained, using the present-value (PV) method only implies that money now is worth more than money later. He then tried to show how this "law of nature" does not apply to a nonprofit organization or, more specifically, a governmental agency.

Let's look at the relevant economics. Suppose Project A and Project B have the same dollar cost and offer the same benefits, but A must be paid for in cash today, while B can be paid for 10 years from today.

How could a nonprofit organization or governmental agency benefit by choosing Project A?

Charles Gille

Santa Barbara, Calif.

Is Obesity the Waiter's Fault?

In the July 26 article, "Blame for Steve Karagianis' Death On Our Shoulders," Kenniston W. Lord Jr. blamed the DP industry for the death of a suicidal young man.

I submit that temporary confinement, especially in light of one's own knowledge of innocence, is no reason to kill oneself. The data processing industry is no more responsible for that death than waiters in a restaurant are responsible for obesity.

Barry M. Chasen

Columbia, Md.

Data Past

Eight Years Ago
Aug. 21, 1968

LACKAWANNA, N.Y. — A petition filed with the National Labor Relations Board (NLRB) by the United Steel Workers of America asked to have 18 programmers and systems analysts at a Bethlehem Steel Corp. plant here ruled as clerical workers and included in the union's clerical unit. NLRB concluded the DP personnel could not be grouped in such a manner because of differences in job function.

— — —

CAMBRIDGE, Mass. — B.F. Skinner, the patron saint of programmed instruction, went on record to say computers were just a fad as teaching devices. Discussing the matter with *Forbes* interviewers, he said: "Setting up a computer to teach children is just idiotic" and that a "simple programmed workbook will do what the computer can do at one-tenth the cost."

Five Years Ago
Aug. 25, 1971

WASHINGTON, D.C. — A price freeze instituted by President Richard Nixon was seen as a boon to computer users. However, it had a negative impact on users planning to buy foreign-made units or equipment manufactured by overseas divisions of U.S. firms.

— — —

NEW YORK — A committee of top executives representing grocery manufacturers, wholesalers and retailers concluded it was feasible to develop a standard system for identifying grocery items — the Universal Product Code (UPC). Analyses prepared for the committee by McKinsey & Co. indicated the benefits of automated checkstands would outweigh the costs by more than $100 million annually.

An Open Letter

The Honorable Jack Brooks
House of Representatives
Washington, D.C. 20515
Dear Jack,

Wish I could have been at your hearings! Not only do I remember vividly where the body is buried but I reluctantly cast a few shovelfuls on the breast of the shrivelled corpse myself. This letter will be too late to get into your documentation — if I thought it could I would write more formally and at greater length — but perhaps it will help you shape your own thinking if you later propose legislation or urge action on the standards community.

I assume you were asking, as you have so many times before, why DP standards come along so slowly, why neither the manufacturers nor the user community pay much attention to them anyhow, and why the Brooks Bill hasn't produced much improvement in Federal computing and data processing. There are a dozen major reasons; let me focus on just two, which in my personal view outweigh the others.

First, an external matter: national organization. The American National Standards Institute is a poor thing — poorly managed, poorly funded, poorly connected to national economic and technical policy, and putty in the hands of industry. Our DP standards are in bondage to their sponsor, the Computer and Business Equipment Manufacturers Association — a classical case of setting the fox to watch the chickens. Each member of CBEMA, and notably IBM, is enthusiastic about those practices, proposed and *de facto* standards, and finished standards, which help in the marketplace, and does everything it can to discourage, delay and pervert all those which hurt. Thus, when I was at the Bureau of Standards, Honeywell wanted to delay the ASCII interchange code until it was ready to announce byte-oriented equipment, and IBM opposed the character set and code entirely, since it had a proprietary one.

This is natural, Jack; it's how our country works, and I'm not calling for altruism instead of competition. But it is sheer folly to place the coordinating mechanism, the standards sponsorship, in such hands. The DP standards sponsor ought to be above the battle, or at least user-dominated. The obvious candidate is AFIPS, the federation of professional societies. But CBEMA must put several hundred thousand dollars a year into standards work: salaries, overhead, travel, publications. And that doesn't count the indirect support of many other organizations, including NBS and ACM.

If industrial memberships in the DP standards work required a stiff annual fee (as membership in CBEMA does now), sponsorship other than CBEMA becomes practical; could be a special institute, could be AFIPS or one of the AFIPS societies. The subvention has to be enough to support a sizable paid staff; volunteers are ruled out, since they would have primary loyalties elsewhere — to UNIVAC or MIT or the Bank of America.

Moreover, committee work ought to be partially funded. Where a volunteer needs travel money or secretarial services, and cannot get them even with strings attached from his or her employer, the committee or subcommittee ought to be able to offer support. I wish ACM could do this for its standards workers; at the moment, we find it too expensive, and have just lost a knowledgeable chairman in consequence.

So much for that; I could go on at much greater length, but the point is made. Now, about an internal problem: the National Bureau of Standards. The "dirty secret" at NBS is in fact an open one, and I believe you already know it. The Bureau regards itself as a research laboratory of physics and chemistry — an attitude mirrored overseas by the corresponding outfit in Britain, the National Physical Laboratory. It undertakes assignments in the standards area — whether about the compressive strength of concrete or the requirements of a COBOL compiler — with reluctance bordering on distaste. When Lew Branscomb removed me as director of the NBS computer activity, he told me bluntly that it was the job of the Bureau and its components only to create and refine methods of measurement (computer performance, for instance, or the magnetic properties of storage media). Others, he said, should set requirements and talk about cost effectiveness. I countered that the Brooks Bill made NBS the technical representative of the largest computer *consumer* in the world, the U.S. Government, and that I had been hired by his predecessor to direct precisely that effort. I told him that in determining to advise the Federal procurement people not to acquire any System/3s, I had done the required laboratory work — personally, that is. I had counted the columns on the new card! Crunch!

I do not believe it is possible to change the deep motivations of The Old Bureau by much. Nor do I believe the General Services Administration can be trusted to do highly technical work; they seem hard put to it to keep elevators and car pools going. You are trying to improve operations, across the civilian and military agencies, which cost well over $5 billion a year; would it be out of the question to set up an entirely independent bureau, or one combined with the equally costly and equally technical work the Federal establishment needs in telecommunications? It could still be in Commerce, although sooner or later you are surely going to have to come to a Department of Science and Technology or something of the sort.

Jack, you're right: this *is* worth doing. The Feds could deliver better work, and save a billion bucks a year besides. And standards, along with clever procurement and improved personnel practices, could do it. But you're going to have to get CBEMA and NBS out of the way first.

Herb Grosch

Model Pinpoints Total Cost to Implement Privacy Act

The Privacy Act of 1974 has two major areas. One is the payload area — requiring safeguards to be used to see that information is correct, kept secure and distributed only to proper recipients. This deals with the computer records themselves. The other area of the Privacy Act is the overhead area — Subsection e(5), which requires holders of data banks to keep records showing what has been going on with the data in the bank.

The Taylor Report
By
Alan Taylor, CDP

The cost of all this has been one of the most hotly contested areas in the privacy arena. No one likes adding costs to anything, and few people are able to estimate intuitively just what the cost of either the actual privacy or the recordkeeping requirement really is.

Now there is an estimating method. A computer model has been developed which breaks down the costs in a standard manner, based upon the answers provided to some 80 questions. The model itself (NBSIR 76-985) was developed by Robert Goldstein and Henry Seward, both of DP Management Corp. in Lexington, Mass., and is available from the National Bureau of Standards (NBS).

The model works through the various compliance steps — 17 in all. Step 15, for instance, deals with the training requirement. Training programs have to be given both to the data base owner's employees and to user groups.

The model breaks these programs down into nonrecurring and recurring refresher training, and then further into four quantities — initial training, management preparation for both the internal initial training and the giving of classes to outsiders, recurring training and refresher outsider training.

The actual training computations are quite simple. Here is the complete program:

```
QUAN(18,3) = NCLK*HTRC
QUAN(18,2) =
         /(NCLK*HTRC +
      NUSR*HTRU)/SCLS
QUAN(18,14) =
        FTR*QUAN(18,3)
QUAN(18,13) =
        FTR*QUAN(18,2)
```

where:

HTRC is the number of class hours required to train clerical personnel.

NCLK is the number of clerks involved in running the system.

HTRC is the number of class hours training required for clerical personnel.

NUSR is the number of potential users of the system.

HTRU is the hours training system users needed.

SCLS is the size of the training class.

FTR is the frequency of training.

The values for some of these are obtained from questions 10, 12, 58, 59. These give NUSR, NCLK, HTRC and HTRU.

The model provides the more variable information such as FTR and SCLS. This makes it possible to select from various possibilities to determine which approach seems most appropriate for particular situations.

If, for instance, you had the results shown in Table 1 for your own system, showing that 24% of the cost was in answering questions about the existence of records, you might want to check what the cost would be to notify everyone of the existence of their records.

Then again, looking at the results from another firm (although firms are not covered by the legislation, a number of them are studying the problem and implementing many equivalent measures already), one might find the percentages for data accuracy (30%) and answering queries for record existence (24%) were not the two highest percentages, but that maintaining the usage log and retroactive claim dissemination were where the money was going. That would immediately focus attention on better, more economical ways to handle data banks

In fact, we have to realize we are in a transition period. The basic decisions with regard to data base design were made in the prelegislated privacy era. Now that that era has opened we have to explore a great many possibilities in searching for the most economical compliance method both this year and in the future. Availability of the model economically, and the availability of NBS as a depository of information about how things are going is an excellent start.

Compliance Technique		Conversion Totals		Annual Totals
Data Supply Oblig Notif	$	111.(15%)	$	0.(0%)
Usage Authorization	$	14.(1%)	$	95.(5%)
Usage Log Maintenance	$	80.(10%)	$	37.(2%)
Record Existence Inq	$	2.(0%)	$	383.(24%)
Record Usage Inq	$	0.(0%)	$	118.(7%)
Data Accuracy	$	1.(0%)	$	480.(30%)
Additional Data	$	0.(0%)	$	5(0%)
Data Accuracy Inquiries	$	0.(0%)	$	270.(16%)
Subject Claim Storage	$	0.(0%)	$	3.(0%)
Subject Claim Dissem	$	68.(9%)	$	17.(1%)
Retro Claim Dissem	$	0.(0%)	$	12.(0%)
Legal Process Notif	$	0.(0%)	$	0.(0%)
Physical Security	$	124.(16%)	$	78.(4%)
User Training	$	312.(42%)	$	62.(3%)
System Assurance	$	20.(2%)	$	29.(1%)
Public Notice	$	0.(0%)	$	1.(0%)
Totals	$	732	$	1,590

The report shown illustrates one of the main outputs of the model. The figures are realistic, according to one of the authors of the model, Dr. Henry Seward, although in the interest of privacy they are not found in any actual live use of the model. All figures are rounded down and given in thousands of dollars.

In Terms of Cost-Effectiveness

Integrating Documentation, Education Seen Beneficial

By Joseph A. Komar
Special to Computerworld

Most people would agree the purpose of documentation is to communicate. However, to really understand the purpose of documentation, we must ask, "Why do we want to communicate?"

The answer should be that we intend people to act in a certain way – in other words, we want programmers to efficiently maintain the system, operators to operate the system successfully, users to use the system correctly.

Our ultimate objective must be in terms of the desired end result; otherwise, there really is no purpose to documentation. We cannot just communicate, we must communicate for a reason.

Documentation was originally written by programmers and analysts so the systems designed would be able to be used and maintained by others. It soon became clear there was a great deal of documentation required and this effort transformed programmers and analysts into journalists.

Therefore, most larger DP shops employ technical writers to assist in writing this vast amount of documentation.

In addition to the documentation produced, education programs were also developed. The training is usually user-oriented although, in some cases, there is also a need to train programmers, analysts and operators.

Many times this training entails little more than the lead analyst standing up in front of a group doing a "show-and-tell" presentation of the system. Again, the ultimate purpose is the same as for documentation – to have people act or behave in a desired way.

Ultimate Objectives Similar

Is documentation, therefore, different from education if both have the same ultimate objective of behavior modification? No! There is really no difference if we look at desired results.

It can be argued there is a difference in form because documentation is written and training is "live," but this is a cosmetic difference and does not change the fact that they are identical in purpose.

Unfortunately, this identity of purpose is often not recognized or soon forgotten. This leads to a disjointed and redundant effort in the development of documentation and education. The documentation is written by technical writers and the education is developed by the lead analyst or the training department.

Reader Commentary

Any integration of these two efforts is all too often accidental. In some cases there is overlap in effort – the instructor reads the documentation in class – and in many cases there are critical areas left uncovered in both the education and the documentation.

At one extreme we've spent excess time and money, and at the other we've run the risk of not accomplishing our ultimate goals.

Necessary Steps

What is needed is an integrated, comprehensive application of educational principles to both documentation and education. We need to recognize our ultimate goal and then proceed through the following steps:

- *Define the audience.* Whose behaviors are we attempting to change – users, programmers, operators, customers?

In addition, what are the characteristics of each of these groups? Are the users managers, executives or clerks? Are the programmers entry-level, applications or systems?

This step will define whose behavior we need to change and may provide convenient categories for development of materials.

- *Specify desired behaviors.* We should begin with the desired ultimate behavior – e.g., successful system operation – and work backward identifying each of the specific behaviors required to achieve the ultimate objective.

We will also be able to sort and sequence sets of objectives into logical wholes that will serve as a unit of learning.

- *Design and develop.* Once the audience and units are defined, it is possible to select the appropriate form of presentation.

For example, complex materials might be best presented in a classroom situation supplemented by written materials; motivational aspects might be best handled through lecture/discussion; detailed but simple material is best presented through printed matter; audio/visual materials can be effectively used for a variety of purposes.

There is a wide variety of trade-offs to be made in terms of costs, schedules, resources available, geography and number of individuals in the audience population. The materials developed will, however, provide a cost-effective mixture from among the infinite number of possibilities.

- *Test.* Since the objectives are stated in terms of desired behaviors, the materials are easily tested. For example, is the individual able to perform the functions desired after reading the user manual?

Testing is necessary, but is too often forgotten. A good test will greatly enhance all the materials developed.

Worth the Effort?

There is little doubt that an integrated approach to documentation and education will provide a much more cohesive, effective set of materials and methods. The question is, is it worth it?

In this author's experience, it has been extremely cost-effective. By developing a user manual that also teaches and providing a seminar to supplement and give practice, users can quickly learn how to use a software package and apply it to their day-to-day work.

Take a look at your training budget and add to it what documentation costs to develop. Are you getting the maximum effect from both? Would you get a greater effect by combining these efforts?

Consider the following potential benefits you might be missing: reduced instructor based training, reduced travel expenses for training, increased user confidence, systems that can more easily be maintained and fewer operational problems.

The consistent application of educational principles to *both* training and documentation can easily be accomplished and will provide maximum effect for minimum dollars. Consider putting together an "Edudoc Department" to make potential benefits actual benefits.

Komar is president of Komar and Associates in Burnsville, Minn.

Snobol 68: A Thing of Beauty, But No Help to Programmers

By Miles Benson
Special to Computerworld

The Sociology of Computing

Can a programming language be a failure?

Take Snobol 68, for example.

The academic world thinks it's the most well-defined, rigorous and crisp language ever invented. Its syntax snaps and its semantics crackle and pop. It has capability that hasn't even been used yet.

In fact, that's the problem. Hardly any of it has been used yet.

Implementors read the rigorous definition and turn away as if it had bad breath. Users read the less rigorous definition and scratch their heads in dandruff-disturbing swirls.

For all its esoteric beauty and – to give the software devil its due – pragmatic power, Snobol 68 reverberates with a dull thud in the total world of computing.

There is one implementation, on the UK 1900 (there'll always be an England), but one implementation doth not a groundswell of approval make.

The fact of the matter is, the documentation – and the language – are too complex for all but the finest of intellects. "Mind-boggling" might have been invented to describe Snobol 68.

So what, then, is a failure? If a language is a work of art, a Michelangelo's David among the more malformed Fortrans and Cobols and PL/Is of the world, is it a failure?

If a language is never used for the purpose it was designed for, to solve problems in the real world, is it a failure?

If a tree falls in the forest and no one is there to hear it, does it make a sound?

That's a set of questions I'm happy to duck. But they're fertile material for the next computing bull session you find yourself in.

erisa?

If the personal penalties for management violation of the Employee Retirement Income Security Act of 1974 have you worried, then take heart.

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WANG

Letters to the Editor

No More Favors, Please

With all due respect to James Vaughan's opinion on what would be good for existing and yet-to-be-created computer maintenance service companies [CW, Aug. 9], please don't do me any more favors like IBM did when it unbundled software and education from my systems rent.

This might benefit the DP division installations, but to price maintenance separately from rent is only going to cost me money and give me nothing.

To illustrate my point: My installation is located in the east-central part of northern Indiana, three hours from Chicago, two hours from Indianapolis, one hour from Ft. Wayne and two miles from my IBM customer engineer's house. Current cost for maintenance of my system (an IBM 3/8, 3741 and 3742) if purchased is about $500/mo (I lease).

Can any maintenance house match this service for less cost? I doubt it.

IBM, if forced to unbundle leased maintenance, will not be giving its service away and in fact will probably raise the cost of maintenance because of the additional expense of separate accounting.

David G. Nagel
DP Manager

Wabash Alloys, Inc.
Wabash, Ind.

No Way to Measure Skill

Nor Jones may have had a valid objection that testing will not validate the degree of skill one may have in a particular area [CW, July 26], but until someone devises a workable technique of measuring skill, we must continue to measure the knowledge of the person in question.

After reading several articles in *Computerworld* about certification, most of the criticism seems to be coming from those who are afraid to sit for a Certificate in Data Processing (CDP) or Registered Business Programmer (RBP) exam.

David L. Cole

Fort Worth, Texas

CICS Support Enhanced

CHICAGO – Qwik-Screen, a productivity aid from GMA Software, has been enhanced to support a wider range of IBM 360/370-based CICS users by including a Basic Mapping Support (BMS) option in addition to the "hard-coded" maps generated by earlier versions.

Now the user selects a mapping option (BMS macros or a hard-coded map) and a language option, "draws" his desired screen on the IBM 3270 or on the panel layout form, defines the field attribute character and enters the data name associated with each field, GMA said.

The hard-coded map option generates a documented Assembly language map and tables containing the length, buffer address, attributes and the address of the routine which processes the entry, a spokesman added.

The BMS option generates the DFHMDI and DFHMDF macros for both maps and DSECTS for Assembler, Cobol or PL/1 languages as specified by the user.

CATAL, BKEND and COPY statements are also created to aid the user in cataloging and retrieving the macros for assembly. The BMS option is supported by both on-line and batch versions of Qwik-Screen.

Qwik-Screen is available in object deck form on a license basis for a fee of $1,495 from CMA Software, 2946 N. Merrimac Ave., Chicago, Ill. 60634.

'Sara IV' Monitors MVS Sites, Work With SMF, MF1 Records

By Don Leavitt
Of the CW Staff

FALLS CHURCH, Va. – Boeing Computer Services, Inc. (BCS) has completely rewritten its System Analysis and Resource Accounting (Sara) system to support IBM's OS/VS2 Release 2 and 3 (MVS) operating systems, according to the company.

Sara IV was designed to provide visibility into the operational characteristics of MVS, to provide management control of the computing environment and to permit planning and projecting of new system requirements, a spokesman noted.

As with all the IBM-oriented Saras, the latest utilizes the data collected by IBM's System Management Facilities (SMF) as the basis for its reports. The rewrite leading to Sara IV was necessitated by the changes IBM made in SMF under MVS and in extensions in the reports BCS wanted to make available, he said.

IBM's changes to SMF include the deletion of Type I and 12 records which provided data on system wait time and paging activity; the institution of new CPU time fields; and different designation of memory requirements.

The introduction of Virtual I/O, data elements unique to MVS and the addition of so-called MF1 data – the 70 series SMF records – also provided additional sources of input for Sara, the spokesman said.

Given that type of change in its basic input data, Sara IV has been enhanced to report, for example, the MVS unique information. Service units, transaction times and their ratios are on all appropriate reports, the vendor said.

Special reports can be provided by the Sara report writer from the Type 70 series records to study CPU workload and device behavior. Other reports show activity by performance group, an essential in tuning the service unit algorithm used by the System Resource Managers, according to BCS.

The job software vector report provides data on the utilization by individual resource component on a job basis. This has application to the Software Physics approach to system and workload analysis, the company explained.

The program utilization report provides a list of the top 10 programs in six resource utilization categories and assists in isolating critical programs. The device utilization report, typically the second page of all major Sara IV reports, displays data related to each of the Sara device groups, according to the spokesman.

All technical-level reports have improved statistical summaries showing totals, averages and standard deviations for all major variables, he added.

BCS also noted that data with up to 20 intervals can now be selected for plotting; new data including service unit and the Sara-calculated computer resource unit arrival rates are available under this enhancement, the spokesman pointed out.

Enhancing facilities already part of earlier Saras, Sara IV "external file" records have been changed to reflect the SMF-, MVS- and MFI-related data. In addition, exception reporting has been modified so job and step exception reports can be selected independently.

Sara IV is compatible with both Sara III and the Honeywell version (Sara-H) in terms of formats and interpretations. The MVS-oriented package is available for a license fee of $13,000 from BCS at Suite 217, 7777 Leesburg Pike, Falls Church, Va. 22043.

'Acts-11' Puts PDP-11 On-Line

WAYNE, N.J. – The Application Control and Teleprocessing System (Acts-11) from Worldwide Computer Services, Inc. (WCS) is a task monitor for use with Digital Equipment Corp.'s PDP-11/70 under DEC's RSX-11 executive.

The package allows the 11/70 user to implement on-line data base, data entry and message-switching systems formerly requiring more expensive, larger computer systems, WCS said.

Acts-11 provides a table-driven multitask environment for application programmers that is similar to IBM's CICS, Turnkey Systems' Taskmaster or Programming Methods' Intercomm, a spokesman suggested. Programs may be written in Fortran IV Plus or Macro-11 and may be serially reusable between Acts-11 subroutine calls, he said.

Acts-11 supports file accessing, terminal interfacing, storage management and task interfacing. Supplementing RSX-11, the WCS software provides intertask communications without data movement, protects the system from application programmer error and permits multiple use of taska without undue overhead, the spokesman added.

Dynamic full storage addressability is supplied, with storage allocated from Acts-11 buffer pools – which can be used for task-related work areas as well as for intertask data. Thus, according to the vendor, the software increases throughput and decreases response times by reducing disk accessing and RSX node pool contention.

Other Acts-11 features include IBM 2260/3270 support with mapping, dual-access mirrored disk and tape with restart/recovery from both devices, a VT50 3270 simulator and an Acts-11 unit test driver for program development, WCS said.

Still other facilities include an addressable system common storage, an Acts-11 generated task word area, a resident and overlay task feature and support for exclusive read for update, including lock/unlock protection on data being updated, the spokesman added.

The basic Acts-11 system costs $25,000, which includes two months of installation and training at the user's site. WCS is at 177 Lake Drive West, Packanack Lake, Wayne, N.J. 07470.

D.C. Group Plans CPE Conference

LANHAM, Md. – The National Capital Area (NCA) regional group of the Computer Measurement Group, Inc. will conduct a day-long conference on computer performance evaluation (CPE) on Sept. 15 at the Ramada Inn here.

Guest speakers will be Dr. Thomas Bell of Peat Marwick, Mitchell & Co. and Barry Stevens, an independent consultant.

Since NCA is still in the formative stage, part of the morning will be devoted to progress reports of special interest groups and a presentation of proposed bylaws for the group.

The afternoon portion of the conference will consist of concurrent technical seminars with topics expected to cover all major computer manufacturers.

Registration fee is $10. Additional information is available from Robert P. Garrett, U.S. Army Military Personnel Center, Alexandria, Va.

'Caesar' Runs Time-Shared SPSS Chores

RICHMOND, Va. – Taking a classic acronym for a new problem, the APL Services Division of The Computer Co. has introduced the Card Archive and Edit System for APL-RJE (Caesar) which it said allows the direct access, entry and editing of Statistical Package for the Social Sciences (SPSS) data from any on-line APL terminal.

SPSS was originally developed at the National Opinion Research Center, University of Chicago, in 1970. Since then it has been adapted to various machine/operating system environments by various organizations.

An enhanced version of SPSS is available through the national Action/APL.SV time-sharing facilities marketed by The Computer Co. With the SPSS/Caesar combination, users can now work with the SPSS control cards and system job control language in conversational mode, an APL Services Division spokeswoman noted.

In this environment, SPSS-printed output and raw data are returned to an APL file which the user may access whenever it is convenient. The data is also available for additional processing in time-sharing mode through the network's APL-based statistical library.

The data editing capabilities of SPSS/Caesar are as important as the easier control card preparation, the spokeswoman said, noting also that "certain unique requirements" of SPSS, such as correct column placement for control and specification fields, are "automatically fulfilled by Caesar."

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Mathematica Planning Release Of 'Ramis' in DOS/VS Version

PRINCETON, N.J. – A DOS/VS version of Ramis, the data base management system from Mathematica Products Group, Inc., will be released in the fourth quarter, according to the vendor. Expected to be operational on IBM 370/135 and larger mainframes, Ramis will support user application programs written in Cobol, Fortran or PL/I, Mathematica said.

A self-contained nonprocedural language that has been available with the OS/VS version of Ramis is expected, however, to be a mainstay of the DOS/VS users.

The capabilities of that language are said to include support for transaction processing, including file updates and report generation. Free-form English sentences can make up the basis of graphic as well as tabular reports, the company noted.

As a data base system, Ramis supports hierarchical file structures for "naturally describing the relationship" of data fields to one another, Mathematica said. The system also includes a runtime executive which permits the user to catalog often-repeated activities and the logical decisions the system is to make in response to actual operating conditions.

Under the OS and OS/VS versions, an interface was available for using the Ramis report writer with IBM's IMS files.

Costs were not immediately available, but earlier versions ranged from $28,000 to $55,000 depending on options chosen. The firm can be reached through P.O. Box 2392, Princeton, N.J. 08540.

OS Users to Meet Friday

NEW YORK – The Automated Space Management package from Cambridge Systems Group will be discussed at the Aug. 27 meeting here of the OS Eastern Region Systems Group (Oserg).

Users interested in attending can contact Oserg secretary Ruth Johnert at Home Insurance Co., 59 Maiden Lane, New York, N.Y. 10038.

Boole & Babbage Has 'TSA' for MVS Sites

SUNNYVALE, Calif. – Boole & Babbage, Inc. has introduced a version of the Total System Analyzer (TSA) package designed for the IBM MVS environment.

This version will enable users to concentrate optimization efforts in areas that will lead to the greatest CPU usage improvements, according to the vendor. TSA measures the CPU activity of all the system and application program modules. It reports this activity and SVC time for each module and relates this data to the job name which called the module, the vendor said.

Additional TSA reports help the user identify which instructions in the module were the high points of CPU activity. The package also produces plots over time of any module's use, a spokesman noted.

In effect, then, TSA identifies which modules are causing CPU bottlenecks, where the time is spent within the module and which specific job is using the module, he explained.

TSA for MVS is available for $13,000 from the firm at 850 Stewart Drive, Sunnyvale, Calif. 94086.

'Panvalet' Ready for CICS Users

OAK BROOK, Ill. – Pansophic Systems, Inc. has introduced Panvalet/On-Line, an extension of the Panvalet program management and security system that allows on-line edit and update of programs from IBM 3270 terminals through IBM's Customer Information Control System (CICS).

Panvalet is used to establish, maintain and protect a control library of source programs, JCL and card-image data files on a direct access device. By doing away with actual punched cards, the system saves clerical errors and vastly increases the speed of handling these basic DP chores, Pansophic said.

CICS is a terminal-handling system used on IBM 360/370 mainframes in both DOS and OS environments which permits on-line transaction processing initiated through terminal input.

The combination of these facilities in Panvalet/On-Line is said to refine the previously available Panvalet/CICS Option while maintaining the backup support, audit trails, protection and compression capabilities of the basic batch-oriented Panvalet.

Users of Panvalet/On-Line can build, add, delete or change member statements, replace character strings and move statements within a member from one member to another or from one library to another, according to Pansophic.

In addition to having immediate verification of any change shown at the terminal, the system also shows all changes on a hard-copy printout, a spokesman noted.

Panvalet/On-Line is currently available for OS data centers for $7,500. Current users of the CICS Option may acquire the On-Line feature for the difference in cost between the two products. OS Panvalet, required as the base of the On-Line facilities, now costs $5,850.

Panvalet/On-Line for DOS is due for fall release, the company added from 709 Enterprise Drive, Oak Brook, Ill. 60521.

Stoner Models Pipeline Flows

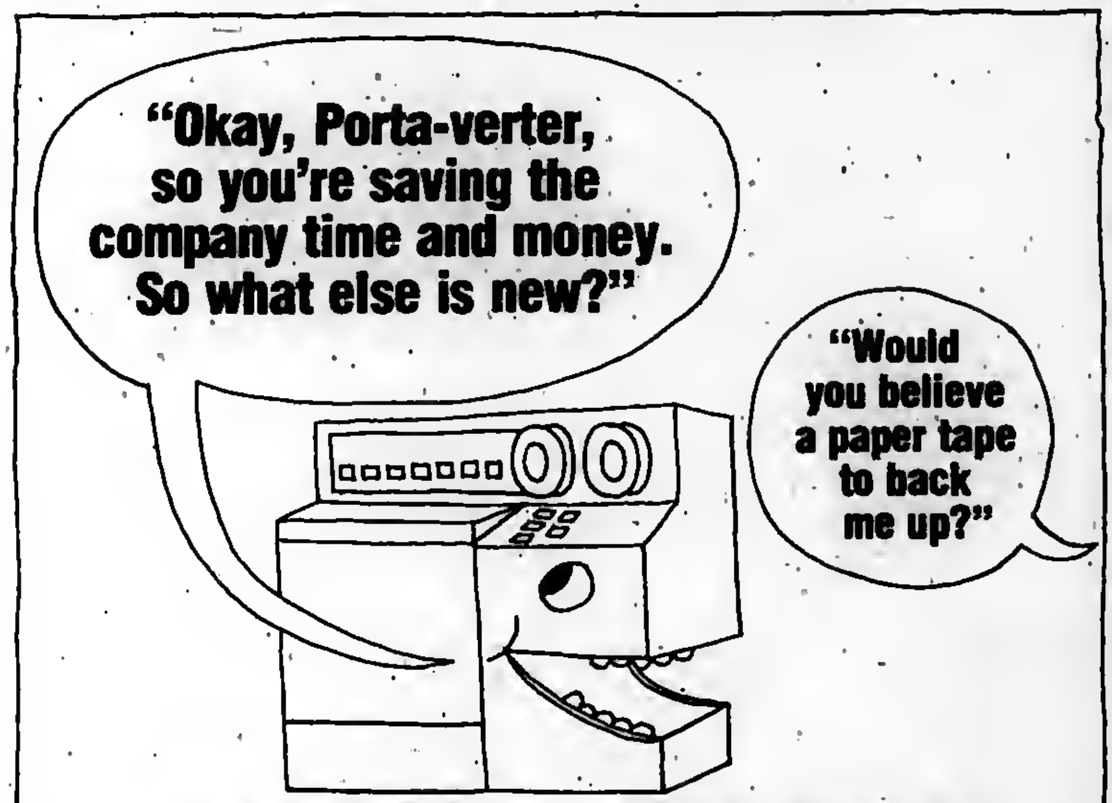
CARLISLE, Pa. – Four proprietary programs which model networks on both gas and liquid pipeline flows have been maintained and supported for several years on a commercial remote-computing network, according to the developer of the programs, Stoner Associates.

The capabilities of the programs are focused at liquids in a steady state, transient liquids and gas in either steady or unsteady states. They can be used by Stoner on behalf of a client or by the client directly through terminals.

In addition to the programs, Stoner offers a range of other services including engineering consulting, staff training sessions and seminars, gas dispatcher training, customized computer programs and support, a spokesman explained.

The company can be retained on a continuing basis or in response to a one-time need, he noted. Once use of the modeling programs has been made available to a client through a license arrangement, Stoner may even drop out of the picture altogether, he added.

The firm can be reached through P.O. Box 86, Carlisle, Pa. 17013.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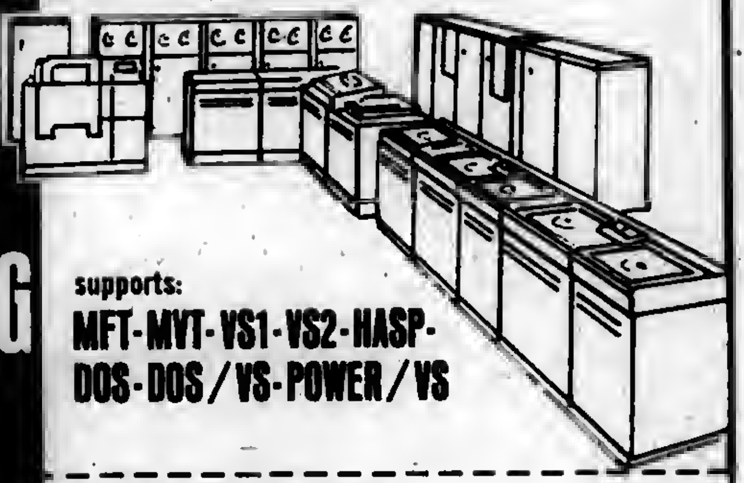

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Local Unit Seen Key to Union in White-Collar Shop

By Jack Stone

Special to Computerworld

This letter is from a husband and wife team of labor consultants. They report additional information regarding the extent of unionism in the DP industry [CW, June 21].

Dear Jack:

We read your piece on the challenge of unionism for DP managers with special interest. With a combined total of some 25 years in white-collar unions (Railway Clerks, Teachers and Office and Professional Employees), we thought it striking that the problems, advantages and disadvantages you outlined are valid for almost any white-collar working situation.

Although office employees (as opposed to factory workers) have been slow to recognize the advantages of being organized, recent activities among teachers and government workers have made the public increasingly aware that office people have the right to representation as well.

In his recent book, *White Collar Union*, Joseph E. Finley explained that "recruiting an office clerical group into unionism today usually involves a careful, finely tuned contest for the loyalties and consent of the work force, a much more sophisticated endeavor than winning over a band of rebellious factory workers."

Stone is interested in hearing from DP organizations that are now unionized or are planning union activities.

Readers are also invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations and personnel management.

Selected letters will be published in Computerworld, *along with commentary by Stone, in this column.*

Letters should not exceed 500 words and should include the name, title, organization and address of the sender for acknowledgement purposes. This information will be treated as confidential and withheld from publication unless authorized for release by the sender.

He went on to say that, at the thought of committing themselves to a union, "they are filled with anxiety, hesitation, feelings of disloyalty to their bosses, uncertainty about what might happen to them."

Scare stories about activities in monolithic and tightly controlled unions like the Teamsters or some of the building trades have raised concern. Industry-wide bargaining or rigid union discipline is definitely not part of the white-collar scene.

In this case, the individual operating group is the usual "bargaining unit." This unit consists of the men and women in a single company or work place who elect their own officers, decide what issues to bargain about and negotiate a contract with management.

Since no far-away "union boss" is handing down the orders and since the elected representatives maintain constant contact with the people they represent, such thorny issues as promotion on the basis of seniority vs. competence, merit bonuses and the like can be hammered out in a way that seems fairest to the majority of the employees and is acceptable to management as well.

There was one small point in the article with which we would disagree. While a negotiated contract with the union can have the effect of changing erratic or arbitrary handling of management policies and programs into something that is orderly, planned and controlled, this does not always happen.

On the other hand, top management soon becomes aware if its middle management is being arbitrary and unfair in the face of a clearly worded contract. In the long run, the contract can work to everyone's benefit.

One major advantage to both management and individuals that you failed to mention is in the area of upward mobility. The skills required by a good programmer are quite different from those needed by a good manager.

Union activity, however, allows employees to exhibit political and human relations skills that would never ordinarily be noticed by management in the regular course of work. The airlines industry has taken advantage of this fact for years by promoting promising leaders of the Airline Clerks Union into the ranks of management.

A problem DP people may have is not knowing if there even is a union for them. The most generally appropriate organization is the Office of Professional Employees International Union (OPEIU). Its 100,000 members include 5,000 to 10,000 people in computer-related functions.

The American Federation of Government Employees, with jurisdiction over 300,000 people, and the American Federation of State, County and Municipal Employees, with jurisdiction over 750,000 workers, also represent a fair number of DP employees.

The Human Connection

As management policies and budgets continue to tighten under the impact of current economic conditions, working conditions will inevitably become more difficult, layoffs more frequent, in-house training less accessible and promotions slower.

Inevitable Impulse

In such a climate, DP employees will inevitably agree with the president of OPEIU that "professionals are finding that the immediate supervisor or the individual in charge of personnel is not in any way competent to deal with their grievances." Under such conditions, the impulse to organize will also inevitably gain ground.

The big question is: Can management deal effectively with this challenge either by becoming sensitive to the conditions that cause unrest or (if their shop does organize) by accepting this development in a creative and positive fashion that will benefit everyone in the long run.

Lee & Bob Aikin
1754 Swann St. N.W.
Washington, D.C. 20009

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Ed Yourdon and Jerry Weinberg will be examining these and other questions at five one-day State-of-the-Future Conferences in cities across the country the week of September 20th (see box below for dates).

Both of these dynamic thinkers have some very strong views on the subject.

Views that have been tempered by ten years of experience as leaders of the "structured revolution."

Yourdon is the author of *Techniques of Program Structure and Design* and *How to Manage Structured Programming*. And co-author of *Structured Design* and *Structured Programming in COBOL.*

Weinberg is the author of *The Psychology of Computer Programming* and *An Introduction to General Systems Thinking.*

State-of-the-Future Conference Dates	
Washington	September 20th
New York	September 21st
Toronto	September 22nd
Dallas	September 23rd
San Francisco	September 24th

The conference will consist of four major presentations by Yourdon and Weinberg. There will be discussion periods after each session.

Each conference participant will receive a copy of Weinberg's *An Introduction to General Systems Thinking*, and Yourdon and Constantine's *Structured Design.*

Specifically, Jerry Weinberg will speak on *General Systems Design*—the discovery of the deep principles that will chart the course of future design. His second talk will revolve around the subject of *Responsive Design*—a philosophy of designing computer systems that adapt to the idiosyncrasies of people rather than having people adapt to the idiosyncrasies of the computer.

Ed Yourdon will speak about *Structured Design*—the application of general systems theory to the design of computer programs and systems. Coupling, cohesion and design strategies based on data flow and data structure will also be covered. Yourdon will also talk on the subject of *Evolutionary Design*—the concept of integrating the analysis, design and implementation of a computer system as a series of "top-down" versions.

If you wish to attend the State-of-the-Future Conference please fill out the coupon below. But, hurry. Reservations for this one-day trip into the future are limited.

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At Bell Canada

On-Line System Keeping Terminals Up

By Ronald A. Frank
Of the CW Staff

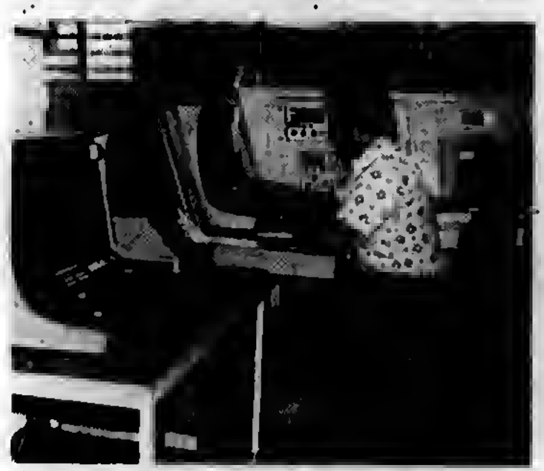
TORONTO – Bell Canada is keeping customer terminals and other data communications equipment healthy by using an on-line data base of maintenance information.

Called the Trouble Report & Information Handling System (Trihs), the data base currently supports 12,000 CRTs, teleprinters, facsimile machines, data couplers and other devices in the Toronto area.

The Trihs information can be accessed from four test centers serving Bell Canada customers with both data and voice offerings by 22 Vucom 1 CRTs and Datacom 300 teleprinters installed at the test centers.

When a trouble report is received from a customer, the basic data is recorded by an operator who calls up the record of the malfunctioning device on a CRT. If the problem is minor or the problem can be corrected in a routine manner, the operator informs the customer of the action that will be taken.

In cases where on-line tests are required, the operator passes on the trouble report to a test center specialist who also calls up the past maintenance information on his display terminal. On-line diagnostics and other tests can then be run from the test center.



Harsh Chauhan, exchange tester, calls up a trouble record.

Dataroute test center will be added to Toronto data base.

At the test center for exchange services here, about 1,200 call/mo are handled; the average time to fix a problem is 1.4 hour, according to Don Powell, test center foreman.

Among the statistics that can be called up from the Trihs data base are the customer's trouble report; the telephone circuit information showing the lines connecting to the user's location, center office facilities, etc.; a record of the user's problems with other equipment; results of service calls; and the record of routine maintenance, Powell said.

The data base is processed on a Digital Equipment Corp. PDP-11/40 at the Toronto exchange services test center. Future expansion of the system will handle trouble reports from digital data customers of the Dataroute service; Dataroute troubles are now handled with a manual system that includes a card on each long-haul circuit.

This Dataroute information will be added to the Trihs data base together with maintenance information on the packet-switched Datapac network when it begins serving customers later this year. Software for the Trihs system was developed by Computing Devices, which implemented the data base for Bell Canada.

CW Photos by R. Frank

Don Powell, test center foreman, accesses Trihs terminal.

At present, Trihs systems with PDP-11/40s are operating here and in Montreal. Expansion plans call for adding similar systems in major service center cities and later interconnecting the data bases.

Unlike U.S. carriers, Bell Canada supplies customers with a full line of DP and communications equipment, much of which is from independent vendors. All equipment is supported by the test centers and carrier field maintenance force.

Varian Package Lets 1100 Emulate 1004

IRVINE, Calif. – Varian Data Machines has a remote job entry (RJE) terminal software package that allows offloading of Univac 1100 series computers executing under the Exec 8 operating system.

The RJE software system, called the TEN 04/RJE, is said to allow a Varian processor to functionally emulate a Univac 1004 RJE terminal. Using the TEN 04/RJE, the Varian computer can communicate with the Univac CPU while optionally performing concurrent local processing.

Currently, Varian's Hasp/RJE is used to offload IBM 360 or 370 CPUs. It also simultaneously provides a mechanism whereby programs and data can be sent to the IBM mainframe, Varian said.

Both the TEN 04/RJE and Hasp/RJE can operate concurrently under Vortex II, Varian's operating system. Priced at $2,500, first shipments of the TEN 04/RJE are scheduled for September.

Varian Data Machines is at 2722 Michelson Drive, Irvine, Calif. 92713.

Independent Controller Eases Network Expansion

MINNETONKA, Minn. – A DP services firm serving the upper Midwest has reported an improvement in its ability to expand its data communications network by installing a Memorex 1270 Terminal Control Unit (TCU) in place of a previous controller supplied by IBM.

Scientific Computers, Inc. (SCI) currently operates 85 communications lines through the 1270 TCU connecting to 85 terminals in client offices in Minnesota, Nebraska, the Dakotas, Iowa, Illinois and Wisconsin.

Primarily wholesale distributors and manufacturers, SCI's clients include a large record distributor, an auto parts supplier, a paper supplier, a paper wholesaler and a hard goods manufacturer.

According to Kirk MacKenzie, SCI's vice-president of operations, the line expansion capabilities of the Memorex 1270 are proving to be superior to the company's previously installed IBM 270X controller in terms of reduced engineering and downtime during network expansion.

"If we now want to add some lines to the system, we merely have to plug in additional circuit cards and cables to the 1270," MacKenzie claimed. "This can be accomplished in a matter of minutes. And it's all plug-compatible with our mainframe 370/135 operating under DOS.

"With the IBM 2701 and 2702 controllers which we used to have, it once took us 18 hours to put in additional lines. It was a major engineering job," he recalled.

The services SCI performs include order entry, invoicing, inventory control, accounts receivables, production and manufacturing control and shop floor control. Data is communicated over private telephone lines at speeds of 134.5-, 2,400- and 4,800 bit/sec.

Output is produced at client locations at speeds ranging from 15 char./sec to 400 line/min.

SCI plans to acquire a second Memorex 1270 soon to accommodate additional lines required by the company's continued growth. Each 1270 has the capacity to handle up to 96 communications lines mixed in any combination of asynchronous and synchronous transmission speeds to 9,600 bit/sec, SCI said.

The 1270 offers speed recognition and transmission code recognition features which automatically allow the use of computer terminals of varying speeds and codes to be used over a single line or lines through the controller; this allows SCI to mix terminals for optimum system configuration, MacKenzie said.

The reliability and maintainability of the Memorex 1270 were factors in the seleetion of the equipment. "The diagnostic capabilities of the 1270 have made troubleshooting much easier," MacKenzie said.

At the same time, rentals on the 1270 are approximately 30% less than the previous IBM controller, he added.

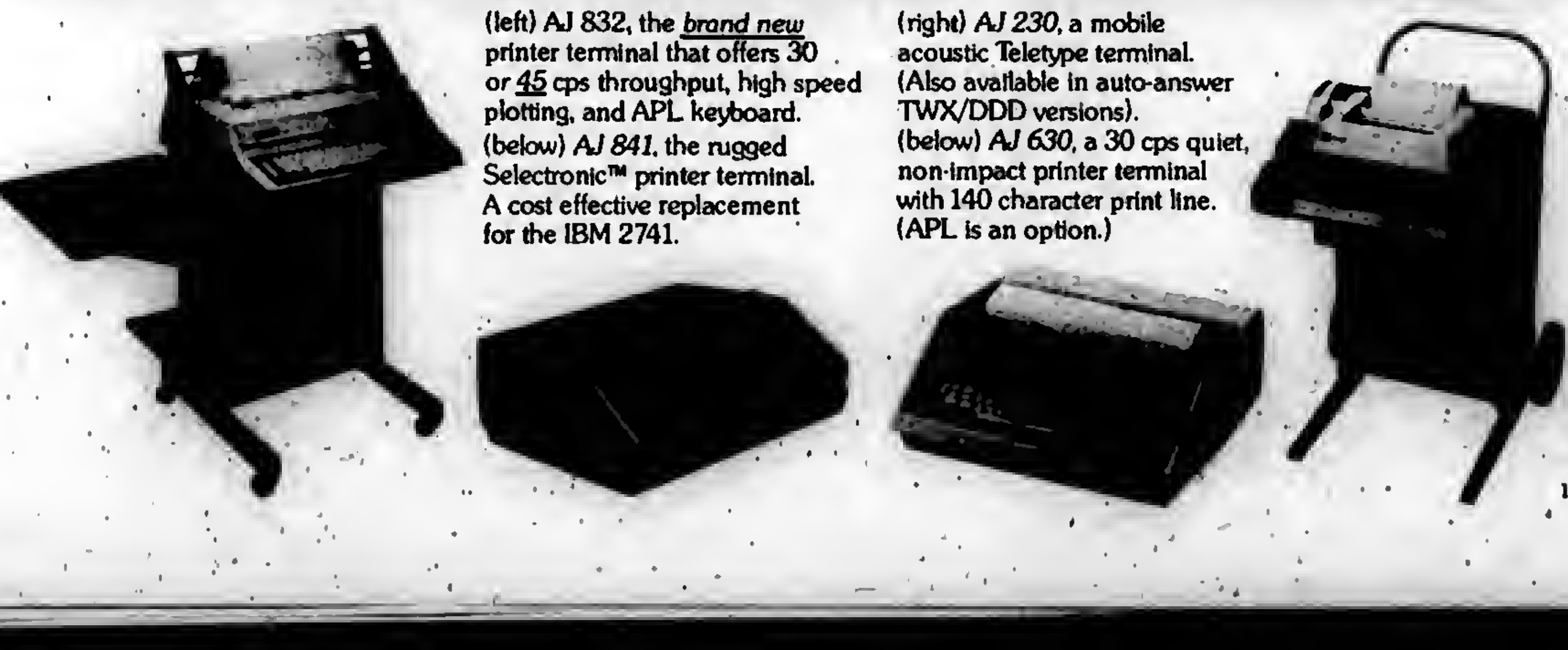
Digital Labs Device Connects Serial Units

WATERTOWN, Mass. – Digital Laboratories has a connection unit that it said allows a user to combine three RS-232C devices such as Teletypes, modems, printing terminals, video displays and computers in a common system.

Called the 3R, the device can be connected to similar units, expanding "indefinitely" the number of devices that can be combined, the firm said.

Each of the three ports on the 3R have associated switches that interchange the transmit and receive signals and set up operation in either the voltage (RS-232C) or current-loop (20 ma) mode.

The unit costs $350 from the vendor at 600 Pleasant St., Watertown, Mass. 02172.



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(right) *AJ 230*, a mobile acoustic Teletype terminal. (Also available in auto-answer TWX/DDD versions).
(below) *AJ 630*, a 30 cps quiet, non-impact printer terminal with 140 character print line. (APL is an option.)

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Library Tests Bar-Coded Book Checkout

URBANA, Ill. – The University of Illinois is testing an IBM library checkout system that might allow optical scanning of 300,000 books in the undergraduate library.

Unit scans book's bar code.

The 3270 terminal system is currently operating in a "pilot test" mode, according to a university spokesman, and a decision on whether to adopt the IBM system will not be made for several months.

The 5926 scanner reads student identification numbers and bar-coded labels in books and enters the information into the 3270 CRT. The terminal is connected to a 370/168 operating under CICS, the spokesman said.

There have been some problems with the ability of the scanner to read bar-coded data on the laminated plastic student ID cards. In addition, the labels to be put in each book may have to remain readable by the scanner for 35 years. This compares with a one-time scanning of items in a supermarket, the spokesman said. The student cards are issued for a four-year period and are also subject to wear, which could affect the ability to scan the information.

If the bar code information can be printed permanently enough for the library application, it will take approximately six months to affix bar code labels to each volume in the library.

In the meantime, library transactions are entered into the 3270 CRT via the more conventional keyboard. A file of checked-out volumes is maintained on the CICS system.

If the reliability problems can be overcome, bar code labels in each volume will be scanned at checkout along with the student ID information.

If the IBM system does not work out, the library may look at a similar system installed at another university by Monarch Systems.

Simulation Methods Help Engineers Find Strains on Tractors

BENTON HARBOR, Mich. – Design engineers at the Construction Machinery Group of Clark Equipment Co. have been using computer simulation techniques for locating strain potentials on new tractor shovel plans for several years.

The computing capabilities needed for this type of design are provided by Structural Dynamics Research Corp. of Cincinnati, Ohio, from their library of structural design software.

The hardware used by Clark includes Tektronix, Inc. display terminals and peripherals. For the last year, Clark engineers have used Tektronic equipment in their "finite element analysis." This analysis often requires as many as 2,000 points to describe a structure.

The equipment includes a 4012 display terminal and a 4631 hard copy unit operating at speeds of from 10- to 120 char./sec to a time-sharing computer. The company plans to add a 4954 graphics tablet to the analysis hardware soon.

Terminal Transactions

With the 4012 it is possible to preview, view and review complicated geometry input. Other uses of the 4012 by the engineering group include plotting statistical failure data and curve fitting programs written in Fortran. The hard-copy unit makes permanent dry copies of the terminal screen either manually from the terminal or under program control. When the 4954 graphics tablet is added, the engineering group will be able to digitize blueprint data off-line into a cassette file for later use.

The first step in any design analysis job is to break the design into a finite element mesh. This is done by hand on the drawing of the model structure. Pertinent data is recorded on an input sheet, and the data file is entered into the computer.

At this point, the three-dimensional line diagram of the planned structure – divided and segmented into a mesh format – is ready for review before the engineer submits the data to the program.

The 4012 displays a graphic representation of the data, and engineers can look at their numeric input via graphics. Mistakes are easy to spot as geometric anomalies. When editing is needed, the terminal is used interactively with the CPU to correct the errors.

Three Basic Parameters

The programs cover three basic parameters which form a total picture of overall structural static and dynamic behavior.

The first parameter is deflection. This measures the kinds of bending and twisting patterns that are inherent in a structure and determines whether it moves to good advantage or not when subjected to anticipated forces and loads. Outline diagrams make deflections graphically clear on the Tektronix terminal screen.

Stress and strain, the second parameter, involves looking for the "hot spots" or areas of high and low stress which can weaken a structure. Both the static and dynamic (via simulated loads) picture of hot spots can be displayed on the terminal screen as isostress contours. This makes analysis as easy as reading topographic maps, the company said.

In the third parameter, engineers look for vibration problems. Every structure has built-in vibration tendencies.

Two years ago, graphics was only available as plotter-drawn diagrams. With the 4012 graphic terminal, Clark engineers get their answers in half the time, and hard copies are available as needed.

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Initial Use Limited

Cray-1 Has Power of Five 370/195s

For years as chief technical honcho at Control Data Corp., Seymour Cray developed the world's largest computers for that firm. In 1972 he left to start Cray Research, Inc. in Minneapolis.

The world has now had an opportunity to study Cray Research's first offering – the superlarge, superspeed Cray-1 computer, which is profiled below.

By Richard M. Russell

Special to Computerworld

A quick look at the Cray-1 yields an immediate impression: The system looks as if it would be more at home in an art gallery than in a computer room.

As the photograph shows, the Cray-1 consists of 12 wedge-like units arranged to complete an arc of about 270°. The power supply is hidden within the system's base, which also doubles as leather-padded seating for about 20 people – which may make it the world's most expensive love seat.

A gauge of its power reveals the Cray-1 is roughly equivalent to five giant IBM 370/195s at a price of an 8M-byte 370/168.

Computation Section

- 64-bit word
- 12.5-nsec clock period
- 2's complement arithmetic
- Scaler and vector processing modes
- Twelve fully segmented functional units
- Eight 24-bit address (A) registers
- Sixty-four-bit intermediate address (B) registers
- Eight 64-bit scalar (S) registers
- Sixty-four 64-bit intermedicate scaler (T) registers
- Eight 64-element vector (V) registers, 64 bit/element
- Four instruction buffers of 64 16-bit parcels each

Memory Section

- Up to 1,048,576 words of bipolar memory (64 data bits and 1 parity bit per word)
- Sixteen banks of up to 65,536 words each
- Four-clock-period bank cycle time
- One-word/clock-period transfer rate to B, T, and V registers
- One-word/2-clock-period transfer rate to A and S registers
- Four-word/clock-period transfer rate to instruction buffers

Input/Output Section

- Twelve full-duplex I/O channels
- Channel groups contain either six input or six output channels
- Channel groups served equally by memory (scanned every four clock periods)
- Channel priority resolved within channel groups
- Maximum channel rate of one 64-bit word/800 nsec with 16-bit channel modules
- Sixteen data bits and three control bit/channel
- Lost data detection

Table 1. Cray-1 Characteristics.

Initially, the system's use will be limited to a small circle of scientific users (an estimated 80 installations) with application interests in nuclear research, seismic analysis and weather modeling; Cray Research has no current plans to sell the Cray-1 in the general-purpose computer market.

The Cray-1 offers only Fortran IV compatibility with other computers. Although some Cray-1s could displace existing CDC Cyber 76s, they should not be thought of as replacement computers like the Amdahl 470V/6s; instead, they should be considered "add-ons" to existing computational resources.

Market Small But Growing

Only seven computers are in the range of the Cray-1. These are the Burroughs Illiac IV, CDC Cyber 76 and Star-100, IBM 370/195, Texas Instruments ASC, Goodyear Aerospace Staran and, potentially, the IMS Associates Hypercube systems.

Of these only two computers, the Star-100 and the ASC, can offer comparable processing power.

Illiac IV offers comparable power, but Burroughs no longer markets it. Only one Illiac IV was ever built, compared with four Star-100s and seven ASCs so far.

Observers note, however, that scientists have an insatiable appetite for computational power. The supercomputer market is far from saturated.

Because of its low price ($4.5 million), the Cray-1 is also likely to appeal to entry-level supercomputer users. These users, instead of adding the Cray-1's computational power to existing facilities, may elect to host the Cray-1 with one of the more powerful minicomputers (Digital Equipment Corp.'s Decsystem-20, for example, or the Hewlett-Packard 3000) that are capable of supporting the languages and data base management applications missing on the Cray-1.

Incorporates Minicomputer

The Cray-1 consists of a mainframe and a Data General minicomputer console processor that also doubles as a maintenance control unit. Like other supercomputers, the Cray-1 holds itself aloof from slow-speed peripheral activities.

Each of the Cray-1's 24 I/O channels is a high-speed channel unsuitable for connection to a slow-speed peripheral device. Apart from peripherals relevant to the maintenance control unit, the only peripherals provided by Cray Research are mass storage subsystems equivalent to CDC's 7639/819 high capacity disk drives. Table 1 details the salient characteristics of the Cray-1.

Operating system support for the Cray-1 is limited to a monoprogramming operating system that processes jobs on a first-in, first-out basis. A multiprogramming operating system is expected in the future but, according to Cray Research, it is debatable whether a multiprogramming approach offers significant benefits for a computer like the Cray-1.

Data communications support is provided entirely by minicomputer (or larger) stations. The first release of the Cray-1 operating system will not provide support for any interactive applications.

Except for a library of mathematical routines and some utility programs, applications and data base management software do not exist.

The Cray-1 is roughly five times as powerful as the Cyber 76 (formerly called the CDC 7600), which was also designed by Seymour Cray. Despite differences in word length and instruction set, there are enough similarities between the two computers for the Cray-1 to be considered an evolutionary system from the Cyber 76.

Vector Processing and Pipelining

Vector processing heads a list of 16 improvements over the Cyber 76 that are detailed in an Auerbach report on the Cray-1. There is some scope for vector processing on the Cyber 76 because of that computer's segmented functional units, but it is limited because of the Cyber's fewer registers and small first-level memory.

The Cray-1 was specifically designed for vector processing. It has an instruction set capable of both scalar and vector operations.

A scalar operation is one that works on one pair of operands at a time: for example, adding two numbers together and storing the result. This is the mode of operation of most general-purpose computers.

Vector operations involve sets of operands. Using the preceding scalar example, a similar vector operation on the Cray-1 would add two sets of 64 pairs of operands together producing 64 results, all as a consequence of executing only one instruction.

The 64 additions do not take place simultaneously (that technique requires an array processor like the Illiac IV), but are pipelined.

Pipelining means the computer's functional units are segmented so instruction execution can be done in steps. On the Cray-1 each step takes a clock period (12.5 nsec) to complete, so that once a pipeline is full (as many as 14 steps can execute concurrently), results are obtained at the rate of one per clock period until all 64 results have been obtained.

World's most expensive love seat?

Sixty-four is not a magic number; it is the number of vector elements in one of the Cray-1's eight vector registers.

The Cray-1's architecture allows for the simultaneous operation of its functional units in both scalar and vector modes. To take advantage of this in vector mode, a technique called "chaining" is utilized.

For example, each of the 64 results from a vector add can be made available immediately to a vector multiply operation taking place in another functional unit. Results from all functional units become available every clock period.

Bandwidth Limits

Chaining, with its potential for creating interim results in local storage for immediate use, effectively increases the Cray-1's maximum number of results per second. However, the Cray-1's bandwidth of 80 word/sec limits the number of results that can be stored in memory. Chaining takes place automatically, although the programmer can influence the degree to which it occurs. In theory, all of the functional units could be chained together to perform a multistop operation.

In practice, usually not more than four units are chained. In a table lookup operation, for instance, the memory/read, shift, integer/subtract (to achieve a compare) and vector-mask generation steps could all be chained together to achieve a very fast scan of table entries. The vector-mask operation is used to determine which of the 64 result elements after the vector subtract is zero, i.e., how far through the table the equal condition occurred.

In some ways, chaining can be thought of as parallel processing, but it should be remembered that each "parallel" operation is actually offset from its neighbors by a variable number of clock periods. In true parallel processing, as found on the Illiac IV or Goodyear Aerospace Staran, parallel operations occur simultaneously.

Russell is project editor for Auerbach Publishers, Inc.

Copies of the compelte Cray-1 report are available for $25 from Auerbach at 6560 N. Pack Drive, Pennsauken, N.J. 08109.

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University Finds Moving Systems 'A Piece of Cake'

By Carl C. Harrington Jr.
Special to Computerworld

SEATTLE – A university DP center here moved two computer systems to a new building one mile away in only 51 hours of downtime.

The University of Washington Academic Computer Center planned the operation as two primary moves in one weekend. The Control Data Corp. Cyber 73 mainframe, moved on Saturday, required eight hours to pack, eight hours to ship and eight hours to bring back up.

The CDC 6400 system continued to process work for 12 more hours and was powered down at midnight Saturday. From that time until 3 p.m. Monday, computing services were unavailable to users. By Tuesday at 8 a.m., the center was operating again at full service.

The CDC 6400 move was more difficult than the Cyber move because its cables are not quick disconnects and each pin must be removed. After consultation with Jim Weir, CDC customer engineer (CE) in charge at the site, it was decided to move the university-owned mainframe as one piece.

Four moving companies bid on the project and the Seattle branch of Lyon Moving & Storage got the contract.

It required six hours to move the mainframe into the truck and four hours to get it back out. It would have required 72 hours to disconnect and reconnect the 6400 at the new site; therefore, 62 hours were saved by moving the 6400 in one piece.

All equipment was moved on schedule with no damage. The communications equipment was switched over on Sunday. The byword of the entire move was: "It's a piece of cake."

All was not a bed of roses, however. Twelve hours before the move (Friday afternoon) the packing material had not arrived and could not be found. It was located at the airport at 6 p.m. A trucking strike had held it there.

Two operators were dispatched with a light truck from the university motor pool and they picked up the packing material. The material weighed 900 pounds and had to be taken out of the truck piece by piece because there was no equipment with which to unload it.

Problem With 6400

After the initial power-down to disconnect the Cyber 73, the CDC 6400 would not come back up. The problem could not be corrected until noon, increasing the total downtime to 51 hours.

When everything was established in the new building, additional minor problems arose. The fire alarm system went off randomly. The air conditioning needed adjusting and the system shut the computers down when the outside temperature went above 75 degrees. That problem was quickly corrected.

However, the curiosity of a new maintenance man flipping switches left the CEs literally holding the system up while the staff ran around trying to find the culprit.

'Better Than Expected'

Overall, the operation went far better than the center had dared to hope. Six months of planning paid off with dividends. The elaborate contingency plans were never needed, but they were held ready in the background.

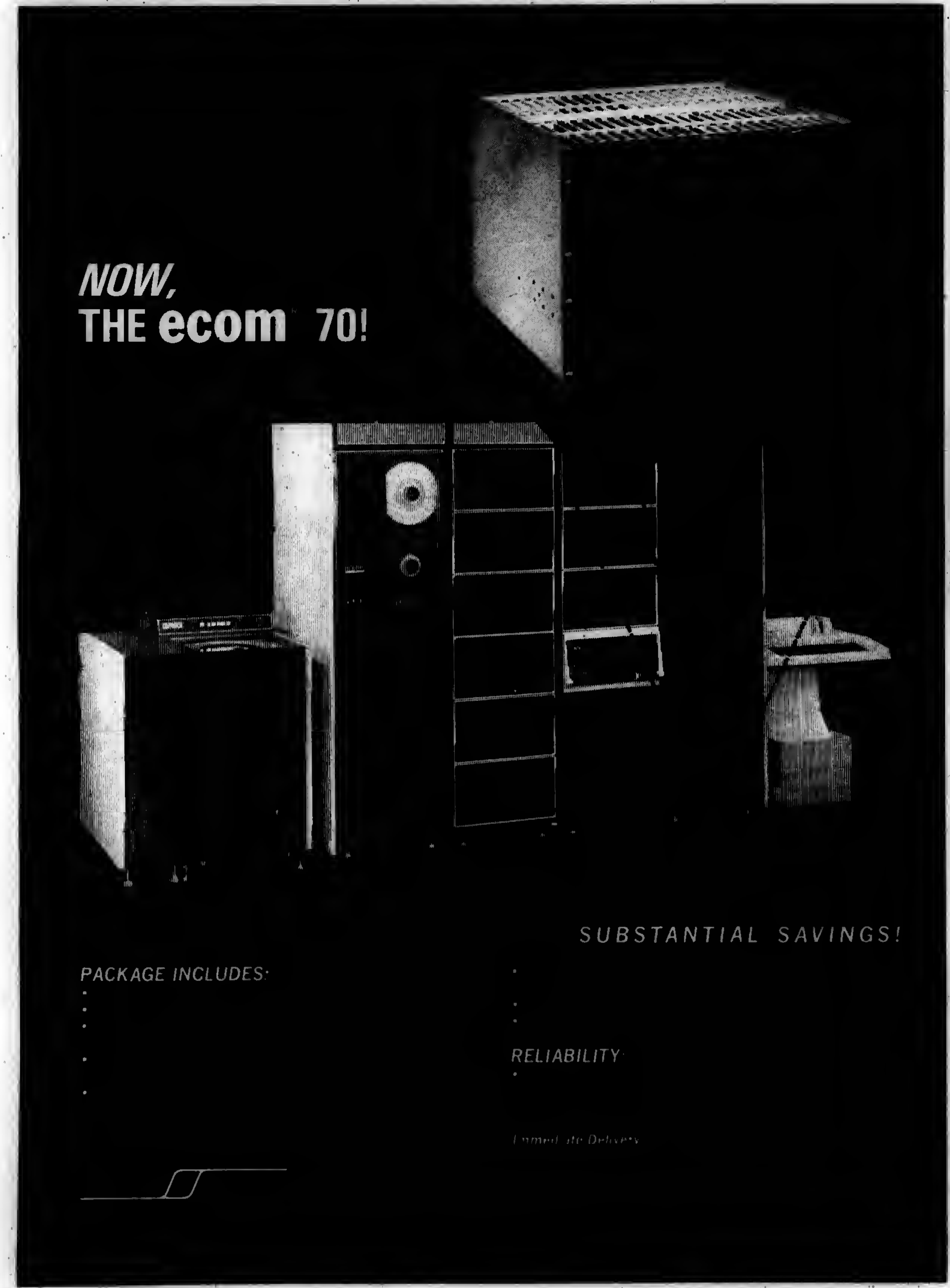
This illustrates a moment in the mile-long move of the university's two computer systems.

The planning did force the center to consider potential problems in detail, thereby discovering otherwise unforeseen problems and correcting them before the move. It found in general, through this process of asking what can go wrong, that apparently minor problems can greatly weaken or disrupt the entire process.

Problems Identified

For example, the basic approach to the move was to take advantage of having two systems and move one at a time. The tape controller was not initially viewed as crucial, but it was identified as the only unit the center does not have at least two of, and it could not start either system without a tape drive. With ample lead time it was able to obtain a second one for the duration of the move.

It also found it was contractually bound to use the vendor's packing material. The center could not proceed with the move without it. The material was ordered early, but, because of a strike, the center did not obtain it until the last minute.



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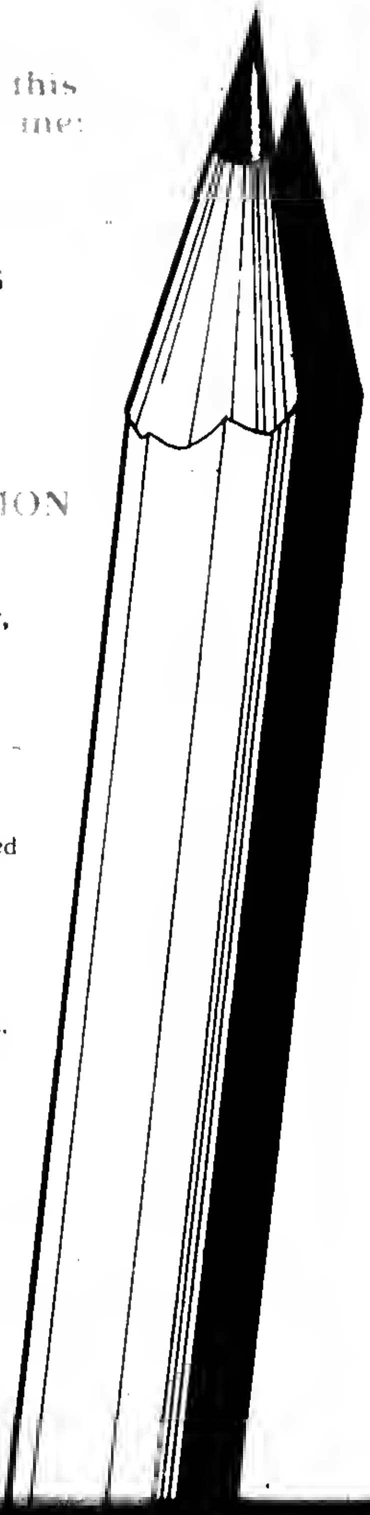

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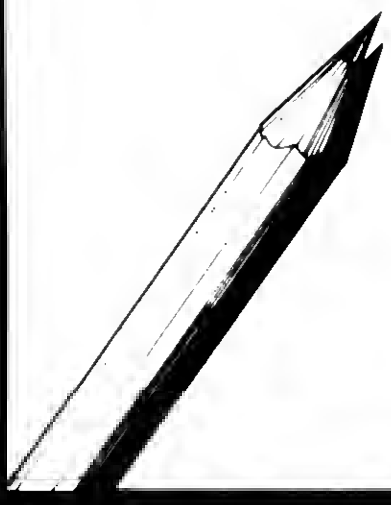

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Mini Bits

HP ROM Control Store Card Available for 21MX CPU

PALO ALTO, Calif. A read-only memory (ROM) control store card for the Hewlett-Packard Co. (HP) 21MX minicomputer is available from that firm.

The card can store eight 256-word modules or 2K words of microcode. It uses chips that can be programmed with a programmable read-only memory (Prom) writer and mounts directly into the I/O section of the 21MX processor, HP said.

A collection of six Prom chips can be used for verifying the card's operation in case of failure, the firm noted.

The card costs $450; the six Prom chips cost $80. HP is at 1501 Page Mill Road, Palo Alto, Calif. 94304.

HI Develops Line Printer For Micro Development Systems

AUSTIN, Texas A line printer designed for use with microprocessor development systems has been introduced by Houston Instrument (HI).

The standard printer has 80 print columns and operates at speeds up to 2,400 line/min; a 132-column version printing at speeds up to 1,400 line/min is also available, HI said.

The interface signals for the printer have been arranged to allow ease of interfacing with most known microprocessor systems, the company added.

The unit costs $3,000 from the firm at One Houston Sq., Austin, Texas 78753.

Fire Safe Stores Magnetic Media

PALO ALTO, Calif. Tah Products Co. has a magnetic media fire safe for small system users.

Called the Datagard, the media safe has been certified by the Underwriters Laboratory to maintain a maximum internal temperature of 150° for one hour with a maximum humidity of 85%, the firm said.

The safe, which costs $1,095, stores two IBM 3348-type data modules, 10 IBM 2315-type disk packs or other combinations of magnetic media including floppy disks, tapes, microfilm and cassettes, the company said from 2690 Hanover St., Palo Alto, Calif. 94304.

Fast Fourier Unit Fits PDP-11s

WOODLAND HILLS, Calif – The MFFT-11 Fast Fourier Transform Processor is now available for use with the Digital Equipment Corp. FDP-11 mini, according to its vendor, the Elsytec Division of Compata, Inc.

The unit, a matched combination of a hardware array processor and signal analysis software, can be used in applications including medicine, biophysics, underwater acoustics, visual image enhancement and speech and voice recognition, the firm said.

The MFFT-11 costs $6,900 and is available from 6150 Canoga Ave., Woodland Hills, Calif. 91364.

Qantex Links System to Micros

PLAINVIEW, N.Y. – Qantex has introduced interfaces to link its data storage systems to the Digital Equipment Corp. LSI-11 and the Mits Altair 8800 microcomputers.

The interfaces allow extended memory capacity of 22.3M to 180M bits, depending on the Qantex unit selected.

The Qantex Model 2200 single-drive system interfaced to the LSI-11 costs $2,815. The interface for the 8800 costs $415 from Qantex at 200 Terminal Drive, Plainview, N.Y. 11803

Because of Taxpayer Demands

Police System Designed to Patrol Data

By Esther Surden
Of the CW Staff

LAKE FOREST, Mich. – Because residents of this affluent Chicago suburb demand accountability for their tax dollars, the police department here has instituted a minicomputer-based information system.

"Our average mortgage last year was $115,000," according to Richard P Johnson, director of fiscal and administrative services for the city. "Since most of our citizens are executives of large companies, they expect high productivity, cost-effectiveness and optimized allocation of resources."

In order to create a police management and performance information system, the city applied for a Law Enforcement Assistance Administration grant through the state Law Enforcement Commission. The goal was to develop "a police reporting system, hopefully one that could be computerized and placed on our IBM 3," Johnson said.

But "we really developed a three-phase police reporting system," he added.

The first phase of the project was a computerized state reporting system. "We had a state report that we were previously compiling by hand," Johnson said, explaining the statistics were manually tallied and then a report was typed and sent to the state.

"We redesigned the field reports the officers fill out," and information from these reports is now keypunched into the system. Programs were developed to edit the information and the state reports are printed from the system.

In the second phase "we took the same case files we built up from the state reports and used them to develop a series of local reports." Such reports, Johnson said, include crimes categorized by location, time of day and day of week and analysis of the crime clearance rates and the different types of crimes occurring.

The third phase of the project involved a manpower assessment system that analyzes what each officer is doing in terms of the amount of time being spent on various activities.

The system, called the Career Organization Assessment and Development System tells the department how close it is coming to meeting the goals it has set; the force can therefore see the impact on the clearance rates of the various amounts of time being put into investigations or on patrol, for example, Johnson said.

Time Savings Realized

The resulting police reporting system has been credited with saving an average of 60 man-hours monthly in office paperwork, improving the police assignment process and providing a basis for officer performance assessment

"Police work is labor-intensive, whether in a large city force of thousands or in our small department of 27 patrol officers and 21 support officers and staff," John E. Daily, project analyst, said.

"We have always known in gross terms what the officers were handling. The information was being collected. But precisely why and how and where they were deployed and how that matched with patterns of activity and community needs were questions we couldn't answer," he noted.

Prior to the implementation of the system "we knew what kind of information we wanted," Johnson said, "but we weren't sure if it would be adaptable to our size IBM 3."

The city has been leasing an IBM 3/10 since 1972. It is a card-only unit, Johnson noted, and has only 8K of memory.

It took a project analyst, a secretary and Johnson with the help of a part-time programmer and systems analyst about a year to bring all phases of the accountability report up. "We ourselves spent about $10,000 to $15,000," he said, adding the grant amounted to about $50,000.

Laboratory's System Assures Chemical Analysis Performed

PITTSBURGH, Pa. – A minicomputer-based recordkeeping system at USS Chemicals here is helping laboratory technicians assure the analysis needed for each chemical shipment is performed.

The Laboratory Services System (Lass) combines a Varian Data Machines minicomputer and applications programs written by the USS chemists, according to Dr. Robert Buckingham, chief plant chemist.

The configuration includes a V72 with 32K of core, disk, a CRT, dual tape cassette and a Centronics Data Computer Corp. line printer

The system is used to enter orders, compile order lists, release shipments and generate daily shipment reports. The data base contains about 600 customer addresses along with information on special testing requirements, customer product codes and information on whether a "Certificate of Analysis" must be shipped with the product.

Previously this information was entered in loose-leaf binders and retrieved manually.

The company decided to purchase a Varian system because of its experience with another of the vendor's systems which had given the lab good service. A determination that a real-time system was needed was made because "when a truck is sitting waiting with an analysis to be done, it has to be done now, not on a batch basis," Buckingham explained.

The company also liked the $40,000 price tag on the system. "We investigated a few other vendors, particularly Digital Equipment Corp., but we went with Varian," he said.

Order Entry Function

Order entry is one of the main system functions. An order from a salesman can be entered into the computer by typing in a 10-digit customer code, the USS Chemicals order number, the requested shipping date and the customer order number.

With those four entries, the computer searches the address files and in one second or less displays the address associated with the customer code.

After the operator verifies the customer address is the correct one, the system displays any requirements for a Certificate of Analysis and requests the products and weights in each order. Following that entry, the mini displays the USS Chemicals identification and the customer code, if any, for verification with the actual order.

Once the orders are stored in the mini, they can be cancelled or altered by an operator. A variety of lists, which previously had to be compiled and typed by a clerical worker, can be displayed on a CRT or printed out.

Lists may be displayed for all of the orders in the file chronologically by shipping date and show the order number, shipping dates, products and the first line of the customer address.

A list giving all the orders scheduled to ship between any two dates can be displayed showing the order date, quantity, customer address and the total quantity for each product between the dates given. Lists may also be displayed showing all the orders in the file for a given customer or a particular product.

Shipment Controls

A sample from every product shipment about to leave the plant must be analyzed by USS Chemicals technicians to determine that the product meets sales specification requirements and that it can be released for shipment.

All shipments of plasticizer, a plastic softening agent, for example, are tested for appearance, odor, specific gravity, water content, acidity and color.

Additional analyses are often required to determine whether the product meets special customer specifications. A wire manufacturer may want an analysis of a plasticizer shipment to determine the product's direct current resistivity; another manufacturer may want the product tested for viscosity.

Approximately 200 special customer specifications are maintained in the Lass data base, Buckingham noted.

When a sample bottle arrives in the lab, the technician enters the order number at the CRT and the customer's address and specifications are displayed.

(Continued on Page 28)

NCR Adds Turnkey for Thrifts

DAYTON, Ohio – An entry-level on-line turnkey system based on a minicomputer is available for thrift institutions from NCR Corp.

The Mini On-Line System Technique (Most) system uses an NCR Century 8200 as the host processor and an NCR 755 communications preprocessor for on-line communications with financial terminals, the firm said.

The system can support up to 10 NCR 270 financial terminals as well as NCR 770 self-service terminals or NCR 796 visual display terminals, according to a spokesman.

System mix and throughput requirements will determine the maximum number of terminals that can be supported, he added

The system uses Century 101 simulation and software is compatible with larger NCR systems, the firm said.

Six modules of software are available: savings, loans, alpha locator, general ledger, statement savings and loans in process.

Hardware includes an 80K Century 8200 processor with two 9.8M-byte disk units, a card reader and a line printer as well as the 755 preprocessor with communications gear.

The hardware costs $103,435 or $2,732/mo on a five-year lease. Software is subject to a $2,800 one-time license fee for the first 12 months and a monthly $112 fee thereafter.

The software is also subject to an installation fee, NCR said from Dayton, Ohio 45479.

To Control Researcher Access

Mini-Based System to Manage 3 Million Documents

KEW, England – A minicomputer-based system that will be used to locate records from more than 3 million documents on 76 miles of shelves will be operational in the Public Records Office (PRO) here soon.

Developed by Data Logic Ltd. in conjunction with PRO, the system will include security control, indexing and document request, checkout and return features.

The system will be based on Data General Corp. hardware including a Nova minicomputer operating under RDOS, two 10M-byte disks, seven CRTs and four teleprinters.

Other hardware will include a Data Recognition Corp. optical mark reader, three badge readers and an interface to three turnstiles, the user said.

PRO maintains the archives of the Central Government of the UK and is a repository of official documents ranging back to rolls of sheepskins.

When the system is put to work, each researcher will have a ticket that allows access to the building via a turnstile and an on-line badge reader if the user is authorized.

On passing through the turnstile, the researcher will enter the document consultation area which includes two search rooms with seating accommodations for 512 people, a map consultation room and a reference room containing the indexes of the archives.

When the researcher finds the appropriate document in the index, reference and personal identification numbers will be keyed into the CRT.

New users are presented with a menu for guidance and there is an assistant to help out.

The system validates the security code and gives the document's location.

On the appropriate floor, a teleprinter prints out two copies of the requisition which names the reader, his identification and seat number, etc. An assistant retrieves the wanted material and replaces it with one copy of the requisition. The document is then given to the reader with the second requisition copy.

When the reader returns the book, the second copy of the requisition is put through an optical mark recognition reader which records the return of the document. Then, after the document is returned to the shelves, the assistant runs the first requisition copy through the mark reader to record the return of the document to the shelves.

System Assures Analyses Done

(Continued from Page 27)

After running the required tests, the technician enters the test results, the tanker truck number and the tank from which the chemical is being shipped. After completing the transaction, a printer at the shipping office produces the shipment releases and prints a Certificate of Analysis if required.

If a product is off specification, the mini requires the name of an individual authorized by the customer to release the shipment before it will allow the release form to be printed.

Prior to this, it was possible for a technician to miss the customer specifications and release the shipment on the basis of the sales specifications only, Buckingham said.

All the transactions are logged on a disk where they can be readily accessed, modified and updated and are later transferred to cassettes for permanent file storage, he added.

The V72 has also streamlined the production of daily half-sheet shipping reports. These are reports giving such information as product, customer and test results on each of the previous day's shipments which go to the sales, material handling and production departments.

Intelligent Data Entry

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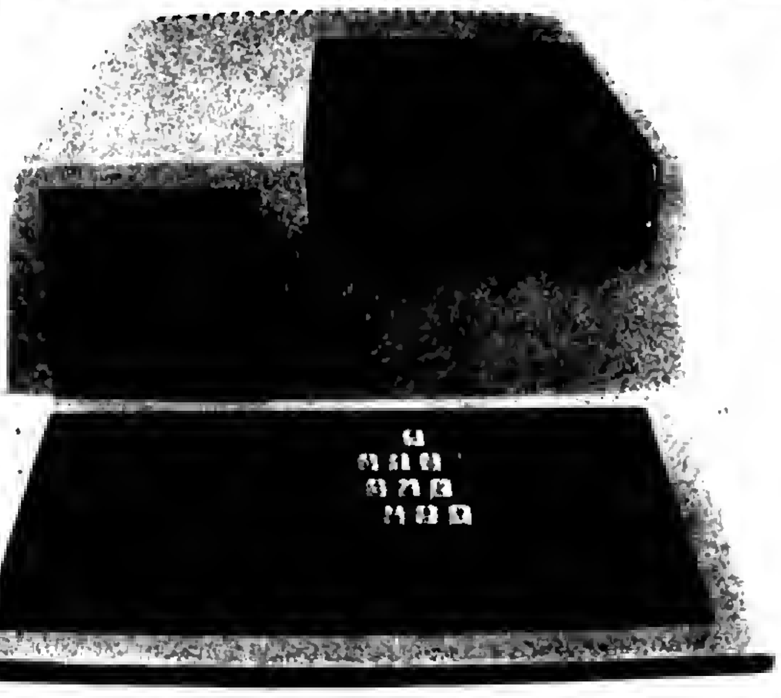

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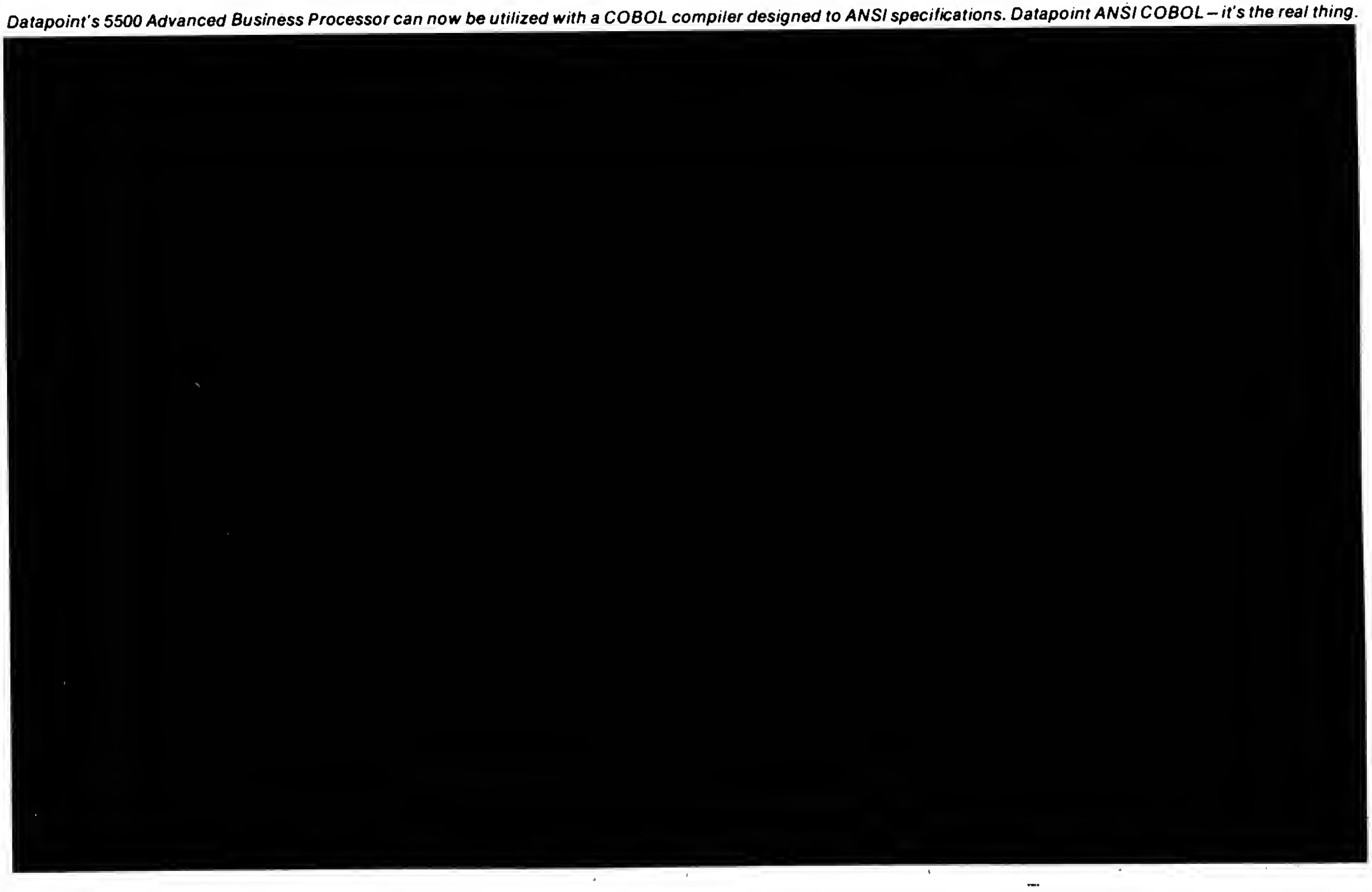

COMPUTER INDUSTRY

CI Notes

Univac Closing Utica Plant, Transferring Operations

UTICA, N.Y. – Univac plans to terminate operations at its manufacturing facility here. About 800 to 850 persons will be laid off.

Utica operations include the manufacture of the 90/30 computer system, keypunches, printers and card punches and readers. These products will be transferred to other plants, although final determinations have not yet been made.

The principal reason for the move, Univac said, is that technological advances have reduced the space requirements for the manufacturing and testing of computer equipment.

Univac plans to phase out the facility by the end of March 1977. The 700,000 sq-ft plant will be put up for sale.

Of the 950 persons currently employed, it is expected that 100 to 150 will be transferred to other company locations, the firm said.

Scotch Strike Halts Level 66s

NEWHOUSE, Scotland – Production of Honeywell Information Systems, Inc.'s Level 66 computers here has been halted by a strike of hourly workers.

The dispute, begun Aug. 11, involves less than 50% of the 270 employees attached to the computer operations here, an HIS spokesman said.

The strike arose from different interpretations by the firm and the union as to when the company could implement raises in accordance with Department of Employment wage controls.

Talks were scheduled for early last week.

Supershorts

The Canadian Cabinet has approved an application from University Computing Co. to establish a Canadian subsidiary called UCC (Canada) Ltd.

– – –

Microdata Corp. has delivered its 500th Reality system.

Fears Harm to Remote Processing

Adapso Making Stand Against Bell Bill

By Toni Wiseman
Of the CW Staff

MONTVALE, N.J. – The Association of Data Processing Service Organizations, Inc. (Adapso) has mounted a congressional and corporate program to protest the Consumer Communications Reform Act of 1976 which, in its opinion, "poses serious adverse consequences for users of remote-access data processing and time-sharing services."

The program is directed toward two primary groups: members of Congress and users of remote-processing services, according to Jerome L. Dreyer, Adapso executive vice-president.

Senators and representatives who to date have supported the Reform Act, also known as the Bell Bill, have received one set of correspondence from Adapso members, while those who have not supported the legislation have received a different set, Dreyer said.

In addition, Adapso members are asking their customers to protest possible passage of the legislation.

In a position paper, Adapso's Remote Processing Services Section stated "it is relatively easy to see that this legislation, if enacted, would lead to increased computer system costs.

"For one thing, the necessity to reconfigure existing networks would . . . inevitably lead to the need to maintain duplicative facilities necessary only for purposes of complying with the conflicting dictates of various jurisdictions.

"These increased costs would necessarily have to be passed along to the consumer in the form of increased prices for the goods or services provided by the industries which have incurred higher computer systema costs," Adapso stated.

Enaction of the legislation would also result in the elimination of competition between telephone common carriers, in particular specialized common carriers, it said.

Passage of the Bell Bill would provide, by statute, that the Federal Communications Commission (FCC) must accept

(Continued on Page 31)

Changes to Accompany Growth In Software Industry: Bauer

WASHINGTON, D.C. – "Ten percent to 15% of computer program steps being executed today represent those from purchased software. In the next 10 years, that figure will rise to the 75% to 80% level," Dr. Walter Bauer recently predicted.

"Revenues from software products will grow to $1 billion in 1980 from a 1976 sales level of under $500 million, according to Bauer, president of Informatics, Inc.

"Software products will be priced on number of commands executed or amount of mainframe time used, rather than on a straight purchase or lease consideration," he told a meeting of the American Institute of Industrial Engineers here.

Bauer also predicted a "large-scale shakeout" in companies supplying software products because of a lack of understanding of software product marketing problems.

In the last three years alone, he added, both the number of software products suppliers and the number of products offered by these companies have nearly doubled.

'Immature' Market

Business and industry today are challenging and testing the cost-effectiveness of their DP operations, Bauer commented, thus providing impetus for the continued development of software that is expertly conceived, "productized" and made easily available to a multiplicity of users.

Based on sound, fundamental eco-

(Continued on Page 31)

FASB Revises Lease Accounting

By Molly Upton
Of the CW Staff

STAMFORD, Conn. – In a second exposure draft, the Financial Accounting Standards Board (FASB) has set forth its criteria for the classification of leases by both lessees and lessors as well as other information on how to account for the transactions.

If approved, the proposal requires firms to apply the standards to leases begun on or after next Jan. 1. and requires retroactive restatement by the end of a four-year transition period.

The new draft takes into consideration the time value of money.

Although the basic lease classifications of the first exposure draft have been retained, changes were made in the criteria for classifying leases after the board received about 240 responses to its first draft.

The formerly proposed criteria of 25% residual value and of special-purpose property have been eliminated.

A new criterion, based on recovery through minimum lease payments of 90% or more of the fair value of the leased property, has been added.

Minimum lease payments, as defined for this purpose, include residual-value guarantees and certain other lessee obligations in addition to rent, FASB observed.

The proposal calls for lessees to classify a lease as a capital lease if it meets one or more of the following four criteria:

- The lease transfers ownership of the property to the lessee by the end of the lease term.
- The lease contains a bargain purchase option.

(Continued on Page 33)

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Sales to Insurers To Almost Double

NEW YORK – Annual sales of DP equipment to the insurance industry will rise from the current level of $526 million to $1.5 billion by 1985, according to a recent study by Frost & Sullivan, Inc. (F&S), a market research firm.

During the next 10 years, about $8 billion worth of computer systems, including peripherals, will be sold within the insurance industry, F&S said.

Of this figure, $6.68 billion will be for systems, $1.4 billion for data entry equipment, $481 million for software and $2.45 billion for services.

The most significant unit sales will be in small business computers, which will range in price from $10,000 to $100,000, F&S noted.

The bulk of these sales will be made to independent insurance agents, the study said.

In addition, the study predicted a trend toward on-line systems, estimating that about 1,000 national insurance companies will implement large on-line systems over the next 10 years to allow direct communication between field offices and regional or central headquarters.

"While DP has certainly been a major part of the insurance industry, it is now being extended in many insurance companies and is starting to be accepted at the independent insurance agent level. The independent insurance agent market represents a virgin territory," the study stated.

Integration will be the key word in the new systems as DP becomes part of all functions and replaces the flow of paper, the report stated.

Changes Seen Along With Software Mart Growth

(Continued from Page 30)

nomics, the future of the software product seems assured, he said.

"However," Bauer told attendees, "in my view the market for software products is immature in many respects. Neither the buyer nor the seller fully appreciates the cost of developing and marketing software.

"If a supplier is to make a profit, he must thoroughly understand his costs and demand an appropriate price," he said.

Bauer said the seller must produce code which can withstand the utmost scrutiny; it must be well-organized and lucid and documentation must be impeccable.

To amplify the problem, the buyer is demanding increasingly higher quality code, better documentation, trial periods, benchmark tests and high-quality field support. The seller is required to meet these demands to compete in the marketplace while absorbing the high costs of marketing an extremely complex product, he said.

If a product cannot be sold for at least $10,000 a copy, it probably has to be sold on the basis of a direct mail effort, he pointed out.

Because of this lack of understanding of software product marketing problems, there is sure to be a large-scale shakeout in companies now supplying software products, Bauer predicted.

Increasingly larger investments are needed and an experienced and highly qualified approach to the business is mandatory; products will become superior, more off-the-shelf in nature and higher priced, he said.

It appears inevitable that only a relative few of the larger or better suppliers will survive in the software products game, Bauer said.

A viable, productive industry will result, he added, offering a good supply of products from which the user may choose.

"Pricing policies," Bauer said, "will be transaction-based in the next decade. More and more, software products will be priced on the basis of number of commands executed or amount of mainframe time used, rather than on a straight purchase or lease consideration," he said.

Adapso Takes Stand Against Bill

(Continued from Page 30)

AT&T's favorite incremental cost methodology as being appropriate in the rate-making context before issuance of final reports by state and federal agencies concerning that methodology, Adapso said.

It would also result in antitrust immunity for acquisitions by telephone companies, the position paper noted.

Adapso is concerned that regulation of interstate computer systems which are now either unregulated or regulated by the FCC would fall under the jurisdiction of individual state public utility commissions.

"Such a step would fragment the existing uniform regulatory scheme which has proven to be advantageous, as is evidenced by the significant technological advances which have been made in computer networks through the efforts of independent companies," the organization said.

"Relegation of jurisdiction over station equipment and termination facilities to state commissions is in direct conflict with having a unified nationwide telephone system.

"It would also render impracticable, if not impossible, many current remote-access data processing and time-sharing applications," Adapso stated.

Expansions

Manufacturing Data Systems, Inc. has relocated its corporate offices to 4251 Plymouth Road, Ann Arbor, Mich. 48105.

Wang Laboratories, Inc. will be relocating its headquarters to the 275,000 sq-ft plant previously occupied by Mostek, Inc. in Lowell, Mass. as of Oct. 1.

Data Devices International, Inc. has added a new building to its facilities in Woodland Hills, Calif.

Beehive Medical Electronics, Inc. has begun building a headquarters facility adjacent to the Salt Lake City International Airport.

Logical Machine Corp. is moving its manufacturing facilities and marketing headquarters to Sunnyvale, Calif.

Dimensional Systems, Inc. has moved its sales and R&D operations to Woburn, Mass.

Incoterm Corp. has more than doubled its administrative and engineering space in its move to 65 Walnut St., Wellesley Hills, Mass. 02181.

Tesdata Systems Corp. has moved its manufacturing and production engineering operation to Sunnyvale Oakmead Village Industrial Park in Sunnyvale, Calif.

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.

Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

1. **Data Communications Course #1010 — Practical Data Communications Systems and Concepts.** Led by Dr. Dixon Doll, this two-day seminar is designed for people who are relatively new to data communications. It presents you with a comprehensive exposure to the important terminology, economic aspects, and functional characteristics of contemporary data communications devices, techniques and systems. Money-saving ideas are an important part of this seminar, and you will see how to implement them using innovative techniques like split-stream modems, diagnostics for fault isolation, modem-sharing devices and digital bridges, remote multiplexers/concentrators, and front-end preprocessors. The seminar will focus on the latest developments in data communications, such as SDLC, IBM's new Synchronous Data Link Control, DDS, Bell's new digital data network, and HiD-LoD, Bell's newly effective tarriff for voice lines. And we'll look at the impact of satellite carriers and specialized carriers as well. This seminar will give you the ability to recognize and solve specific problems in data communications so that you can affect cost savings and performance improvements at your installation.

2. **Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design.** Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Case study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own.
Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithims for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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Lessors Examining Impact of FASB Draft

By Molly Upton
Of the CW Staff

WHITE PLAINS, N.Y. – One thing about the Financial Accounting Standards Board's (FASB) revised exposure draft on lease accounting is certain – lessors are now scurrying to their computer rooms to analyze the effects of the new criteria for classifying leases.

Although the new draft is an improvement in several ways on both current methods and the previous draft, principally because it provides clarification, there are a couple of provisions that Barry Korn of Barrett Capital and Leasing Co. here said are not as favorable to lessors as they might be.

For instance, the section on gross profits on sales-type leases favors computer manufacturers rather than third-party lessors, he said.

Although the requirement they use, the present value of the residual, is less favorable to manufacturers than the previous draft that allowed full residual value, this whole area is "relatively unfavorable to third-party lessors and I think gives an unfair advantage to manufacturer dealers," he said.

This reduces the cost of carrying the lease, he said, allowing manufacturers to receive a greater accounting impact.

Another item of which Korn disapproves is that the draft singles out firms principally engaged in leasing to display leasing information in footnotes.

Calling this "unfair," he said it "potentially favors the large companies in which leasing is a part, such as large banks.

"If leasing is material to a company's business, therefore if one has to disclose this information to be meaningful, I think the burden should be equally on all of the major lessors regardless of the particular capital structure of the company," he said.

Large banks can interpret this provision to mean that leasing, although significant to them, is not their principal business, so they are not required to give footnotes.

Korn saw other items in a positive light. The amortization period for capital leases, for example, is favorable to lessors since capital leases meeting certain criteria may be amortized over the life of the asset rather than over the period of the lease term, he noted.

The FASB draft introduced new criteria for accounting for subleases which is beneficial, he said, since there were previously few if any criteria to cover this aspect.

He said the requirement of retroactive restatements of results is not as unfavorable as most people may think.

"The clarification of the issue itself is positive," he observed.

The 90% recovery of fair value of property is better than the 25% residual value criteria initially proposed," he added.

Variables to Consider

However, there are a number of variables to consider in deciding on one method of leasing over another, he said.

Exley Replaces Anderson As President of NCR

DAYTON, Ohio – Charles E. Exley Jr. has been named president of NCR Corp. effective Sept. 1.

A former Burroughs executive vice-president of finance, Exley has also been named a director of NCR and a member of the board's executive committee.

William S. Anderson, who has been both chairman and president since 1974, will continue as chairman and chief executive officer.

Exley, 46, was a member of the four-man operating committee at Burroughs and a director, in addition to his financial post. He was with Burroughs for 22 years.

IBM Names Three to Posts

ARMONK, N.Y. – IBM has announced changes in three executive positions.

Terry R. Lautenbach became president of the Data Processing Division (DPD), replacing John F. Akers who was recently named an IBM vice-president. Lautenbach was previously DPD vice-president, management services staff.

Akers succeeded Allen J. Krowe as assistant group executive of plans and controls for the Data Processing Products Group (DPPG).

The plans and controls functions headed by Akers provide financial, resource management and product control staff guidance to the group's operating divisions, IBM said.

Krowe, an IBM vice-president, was named head of the corporate business plans staff.

Three Groups at IBM

ARMONK, N.Y. – An overview of IBM structure reveals there are three groups: the Data Processing Product Group (DPPG); the Data Processing Marketing Group, and the General Business Group.

The DPPG includes the General Products, System Communications and System Products Divisions.

The DP Marketing Group includes the DP Division, Federal Systems Division and the Field Engineering Division.

The General Business Group includes four divisions: the General Systems, Office Products, Information Records and General Business Group International Divisions.

Each has a group staff.

FASB Revises Lease Accounting Draft

(Continued from Page 30)

- The lease term is equal to 75% or more of the estimated economic life of the leased property.
- The present value of the minimum lease payments, excluding that portion of payments representing executory costs to be paid by the lessor, equals or exceeds 90% of the excess of the fair value of the leased property to the lessor over any related investment tax credit retained by the lessor.

If the lease does not meet one of these criteria, the lessee shall classify the transaction as an operating lease.

In computing the present value of the minimum capital lease payments, the lessee uses the incremental borrowing rate unless he knows the lessor's computation of the implicit rate is less than the incremental borrowing rate.

A lessor, however, is required to compute the present value of the minimum lease payments using the interest rate implicit in the lease.

A leveraged lease must meet the first three of the above requirements.

A lessor may account for a lease as a sales-type lease or direct financing if the transaction at its inception meets any one of the above four requirements and also both of the following:

- Collectibility of the payments required from the lessee is reasonably predictable.
- No important uncertainties surround the amount of unreimbursable costs yet to be incurred by the lessor under the lease.

A lessee need not display operating leases parenthetically on the face of the balance sheet.

Less information is required to be disclosed in footnotes of lessees' statements. Lessors' footnote disclosures have been reduced and are applicable only to enterprises whose predominant activity is leasing as a lessor.

Amortization procedures are also covered in the draft. A capital asset recorded under a capital lease shall be amortized in a manner consistent with the lessee's normal depreciation policy for owned assets if the lease meets either of the following requirements:

- Transfers property ownership to the lessee by the end of the lease.
- Offers a bargain purchase option.

If neither of the above criteria is met, the period of amortization shall be the lease term.

Proposed standards for leveraged leases are in essentially the same form as in the previous exposure draft, according to FASB.

The draft also outlines accounting for subleases.

The statement is to be applied to leasing transactions begun on or after next Jan. 1, with earlier applications, including retroactive application, encouraged.

If the statement is not applied retroactively beforehand, disclosure of the balance sheet and income effect of retroactive application is required beginning with financial statements for the year ended Dec. 31, 1977.

For statements of periods beginning after Dec. 31, 1980, the statement is to be applied retroactively. When financial statements are presented in conjunction with such statements, they are to be restated to the extent practicable, but at least as far back as the Dec. 31, 1976 balance sheet, FASB said.

Comments on the revised exposure draft are requested in writing by Oct. 1 and should be sent to: Director of Administration, Financial Accounting Standards Board, High Ridge Park, Stamford, Conn. 06905.

Copies of the exposure draft are available free of charge from the FASB Publications Division at the same address.

position announcements

DIRECTOR OF COMPUTER OPERATIONS

Furman University has an immediate opening for a Director of Computer Operations. Responsibilities include supervision of operating personnel; scheduling of computer runs; and maintenance of records on equipment utilization. Minimum qualifications include: Bachelors Degree; two years experience in computer operations; the ability to communicate effectively with both Academic and Administrative Personnel. Experience on Hewlett-Packard-3000 highly desirable. Salary open. Absolute application deadline 9-15-76. Send vita including salary history and requirements to Director of Personnel, Furman University, Poinsett Highway, Greenville, S.C. 29613.

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POSITION ANNOUNCEMENTS

POSITION OPENINGS

Young, dynamic company specializing in computer graphics, process control and data acquisition systems seeks applicants for the following positions:

1. Senior Systems Analyst
2. Senior Field Service Representative
3. Senior Marketing Engineer

Applicants must have a thorough knowledge of DEC PDP 11-34, 45, 55, and 70. Pay commensurate with qualifications to vice-presidency in the near future. Additional job benefit is the opportunity to move to the beautiful and breathtaking north country of Michigan's upper peninsula. Applicants must be willing to assume full responsibilities in the jobs specified and be able to associate with clientele. Limited travel is also required. Applicants please send resume' plus salary requirements to: Engineering Systems Research Company, Tad J. Johnson, P.O. Box 34, L'Anse, Michigan 49946. *Deadline for applications–September 30, 1976. An Equal Opportunity Employer.*

ASSISTANT DIRECTOR OF COURT INFORMATION SYSTEMS — This is a newly created position in the Wisconsin Administrator of Courts Office which will function as the program supervisor and technical specialist for a state-level computerized court statistical and case monitoring system which is currently being developed. Applicants should have a bachelors degree plus four years of progressively responsible data processing and/or management information experience, two years of which involved responsibilities as a project leader of a major computer systems development effort. Preference will be given to applicants with experience in court applications. Salary Range: $18,192-$23,592. Position to be filled on or after October 1, 1976. Send resumes not later than September 8, 1976 to: Edwin M. Wilkie, Administrative Director of Courts, Room 516, 110 E. Main St., Medison, Wisconsin 53703. *An Equal Opportunity/Affirmative Action Employer.*

SENIOR SYSTEM PROGRAMMERS GERMANY

The German subsidiary of one of Europe's largest software consulting and data processing service companies (GSI) has openings in Germany for individuals with strong.

RCA/UNIVAC VMOS and TSOS

experience. Candidates must know system internals and have several years of design and development background. IBM experience considered pluses and preference will be given to those who have knowledge in German. Attractive compensation package and moving expenses are provided. Moderate travel and periodic relocation within Germany is to be expected. Interviews in the USA within one month. Please forward your resume and salary history to:

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R. J. Reynolds Industries, Inc. has a new opening for an IBM System/7 Programmer. The position would report directly to a Systems Manager, R. J. Reynolds Industries, Inc., Systems Department.

Applicants should possess the following:

- Experience in System/7 process control and data acquisition applications in the manufacturing area.
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- Undergraduate degree and knowledge of PL/1 and COBOL desirable.
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Excellent benefits package including paid relocation. Send resume and salary requirements, in confidence, to:

Mr. Denis G. Simon
Corporate Employment Department
R. J. Reynolds Industries, Inc.
401 North Main Street
Winston-Salem, North Carolina 27102

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Incumbent will head the Center's operations division which includes 14 persons and two computer systems. As a member of the management team, responsibilities will include user access to services; accounting and usage records, statistics and studies; coordination with other Center divisions; and, various other administsative functions. College degree plus two years professional experience in a computer center, preferably in a supervisory capacity. Salary range $14,700-$17,688.

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Apply before August 30, 1976, to:
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California State University, Fresno
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Programmer/Analysts

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The University of Georgia has openings for highly qualified Information System Analysts. Individuals selected will be responsible for translating user requirements into detail system design and programming specs including coordination of implementation and programming effort. Will assist in project definition and function as a member of an applications development team primarily in the accounting, payroll, budgeting, student records, and other university related administrative fields. Good communication skills and ability to affectively interface with users essential. Several years experience developing large scale computer systems required. Online and data base management systems experience desirable. Salary commensurate with experience. Send resume, salary history, and references to Manager, Personnel Department; Personnel Services Building, University of Georgia, Athens, Ga. 30602. An Equal Opportunity-Affirmative Action Employer.

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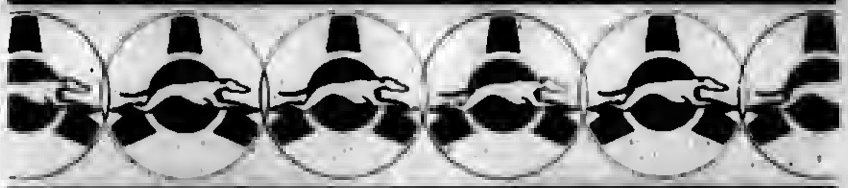

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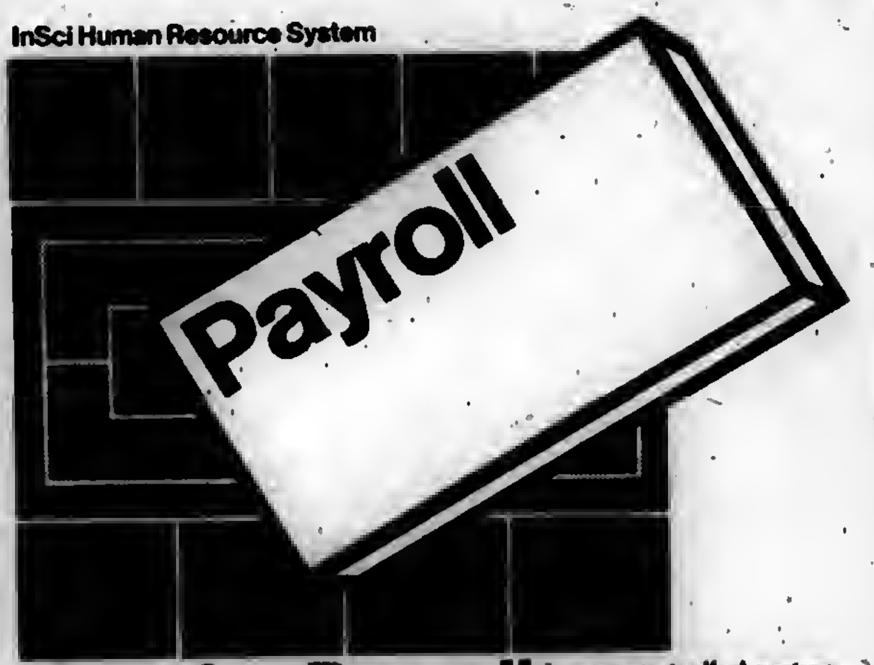

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Nickels & Dimes

Amdahl Corp.'s common went on the block at $27.50 a share.

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Pertec Corp. plans to reincorporate in Delaware.

$$$

Compuscan, Inc. has completed a financing of $3.2 million through a private placement of 522,112 shares of common stock.

$$$

Decision Data Computer Corp. has finalized an amendment to its long-term financing program with its banking group, which will provide the company and its leasing subsidiary with a combined revolving line of credit of $24.75 million.

MAI Sets Records in Three, Nine Months

NEW YORK – Management Assistance, Inc. (MAI) attained record earnings and revenues for the three- and nine-month periods ended June 30 and Chairman Raymond P. Kurshan predicted the firm's earnings for the year will exceed $12 million.

Sales of Basic/Four systems in the quarter rose 16% from $13.7 million in the preceding quarter to $15.9 million.

Backlog for Basic/Fours and related peripherals totaled $23.3 million at the end of June, a 7% increase in three months.

Sorbus, MAI's maintenance subsidiary, sustained a small loss for the quarter because a rise in revenues was insufficient to offset increased expenses in overhead and parts expenses, the firm said.

Corrective measures have been taken to bring these expenses in line with revenue, MAI said.

MAI's revenues during the quarter rose 30% to $31.6 million compared with $24.3 million in the year-ago period.

Earnings, including a $1.1 million tax credit, rose 63% in the quarter to $3.2 million or 11 cents a share compared with nearly $2 million or 7 cents a share in the year-ago period, when the tax credit was $818,000.

For the nine months, revenues rose 28% to $88.7 million compared with $69.1 million last year.

MAI earned $9.2 million or 30 cents a share, including $3.7 million in tax credits, in the nine months. This represents a 112% increased compared with the $4.4 million or 15 cents a share earned in last year's period, when there was a $928,000 tax credit after the $592,000 write-off of receivables due from Potter Instrument Co., Inc.

During both the three and nine months, revenues from rentals declined. For the quarter they were $3.2 million compared with nearly $3.8 million in the year-ago period while for the nine months the figures were $10.1 million compared with nearly $12 million.

Tab Products Earnings Dip in Year Despite Records in Fourth Quarter

PALO ALTO, Calif. – Tab Products Co. scored record earnings and revenues in its fourth quarter ended May 31.

Although earnings for the full year failed to keep pace with those of the previous year, the growth in revenues reflected the increased shipments of data entry products, according to H.W. LeClaire, the firm's president.

"Earnings for the most recent fiscal year, though the second highest in Tab's history, did not equal those of 1975. This was because revenues from filing systems and DP products, our traditional and most profitable lines, declined during the first three quarters of fiscal 1976 due to the recession," he said.

Quarter Up

During the quarter, earnings rose to $475,000 or 57 cents a share compared with $230,000 or 28 cents a share in the same period last year.

Revenues for the quarter totaled nearly $10.9 million compared with $8.6 million in the year-ago period.

For the year, earnings dipped to $1.17 million or $1.40 a share compared with nearly $1.4 million or $1.63 a share in 1975.

Revenues rose to $37.5 million compared with $35.8 million last year.

Observing that Tab is stronger than previously, LeClaire said the firm is emerging as a manufacturer of machine products for the DP marketplace.

Tab has "virtually completed" R&D work on a terminal punch and a key-to-diskette data entry machine, LeClaire said. The terminal punch will interface with minis and communications equipment where card output only is required, he explained.

Tally Posts Increases in Half-Year

KENT, Wash. – Earnings and revenues were up in the quarter and six months ended June 27 at Tally Corp.

The results reflected "significant growth in the industries" Tally serves, "continued product cost reductions and greater efficiencies throughout the company and the reductions of foreign currency exchange losses to $23,000 from $165,000 incurred in the first quarter," according to President Leslie A. Larsen.

For the quarter, the printer maker's revenues rose to $7.2 million compared with $5.4 million in the year-ago period while earnings, including a $401,000 tax credit, reached $942,000 or 27 cents a share.

This compared with earnings of $205,000 or 9 cents a share in the same period last year, when there was a $20,000 tax credit.

Revenues for the six months reached $13.3 million compared with $9.9 million a year-ago.

Earnings, including a $779,000 tax credit, rose to $1.6 million or 46 cents a share compared with $233,000 or 10 cents a share in the 1975 half-year, which included a $55,000 tax credit.

Rapidata Earnings Dive In Quarter, Half-Year

FAIRFIELD, N.J. – Rapidata, Inc.'s second-quarter earnings plummeted to $5,000 on revenues of $3.7 million.

This compares with earnings of $261,089 or 14 cents a share and revenues of $3.6 million in the year-ago period.

For the first six months, Rapidata's earnings totaled $282,961 or 15 cents a share on revenues of almost $7.6 million.

In the 1975 half-year, the company reported earnings of $610,925 or 33 cents a share and revenues of $7.3 million.

"The quarterly decline in earnings was attributed primarily to equipment and personnel expansion, the latter primarily in the marketing area," according to Robert J. O'Brien, Rapidata president.

"The impact on margins was further compounded by a flattening of revenues resulting from a fall-off of business within a few major accounts," he added.

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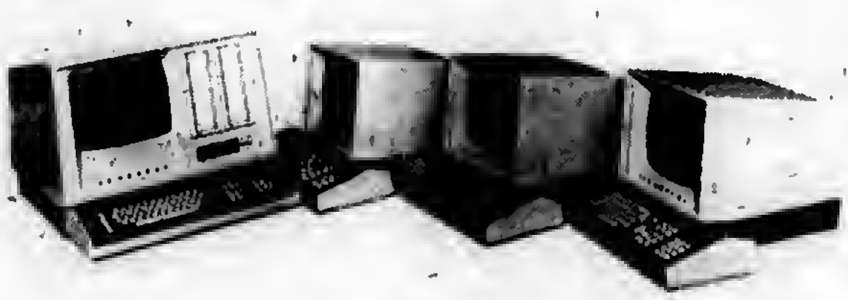

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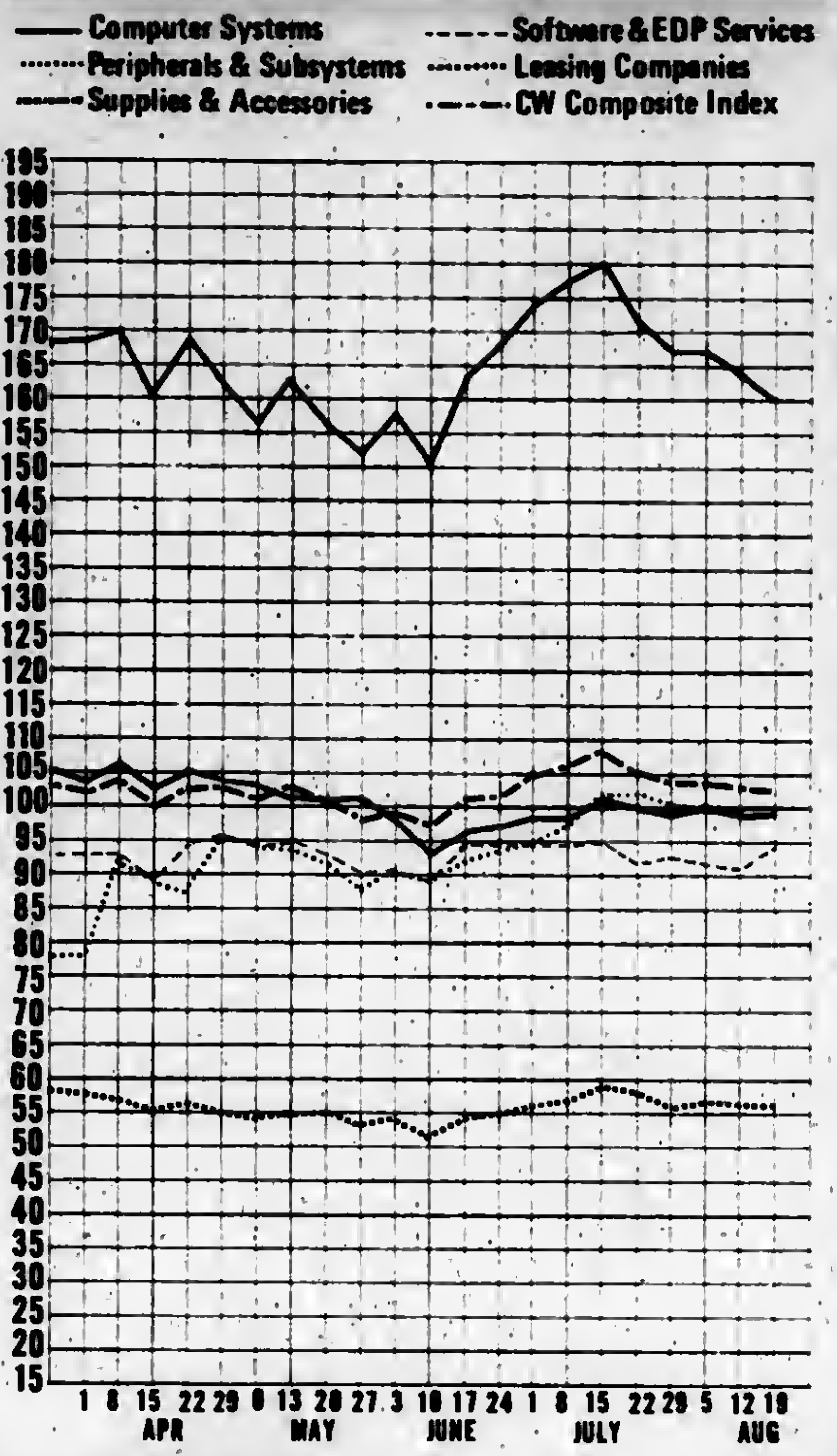

Earnings Reports

GENERAL INSTRUMENT
Three Months Ended May 30

	1976	a1975
Shr Ernd	$.39	b$.10
Revenue	107,198,283	86,449,599
Disc Op	.....	451,000
Earnings	3,216,408	1,091,101

a-Restated to reflect accounting change for foreign currency translations. b-Adjusted to reflect 2% stock dividend in May 1976.

HEWLETT-PACKARD
Three Months Ended April 30

	1976	1975
Shr Ernd	$.86	$.87
Revenue	279,764,000	248,357,000
Earnings	23,771,000	23,952,000
6 Mo Shr	1.40	1.54
Revenue	515,403,000	460,376,000
Earnings	38,347,000	42,365,000

INCOTERM
Three Months Ended May 29

	1976	1975
Shr Ernd	$.18	$.36
Revenue	8,246,000	7,613,000
Tax Cred	.....	193,000
Earnings	356,000	713,000

KEYDATA
Three Months Ended April 30

	1976	1975
Shr Ernd	$.11	$.06
Revenue	3,801,000	3,392,000
Tax Cred	147,000	74,000
Earnings	313,000	155,000
9 Mo Shr	.29	.11
Revenue	11,147,000	9,804,000
Tax Cred	371,000	135,000
Earnings	794,000	291,000

LEWIS BUSINESS FORMS
Three Months Ended April 30

	1976	1975
Shr Ernd	$.21	$.37
Revenue	7,834,000	7,912,000
Earnings	303,000	542,000
6 Mo Shr	.42	.73
Revenue	15,508,000	16,951,000
Earnings	604,000	1,059,000

LOGICON
Year Ended March 31

	1976	1975
Shr Ernd	$.98	$.78
Revenue	31,967,000	33,668,000
Earnings	841,000	670,000
3 Mo Shr	.26	.13
Revenue	7,661,000	7,668,000
Earnings	224,000	114,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 18, 1976

All statistics compiled, computed and formatted by
TRADE*QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE			
		1976 RANGE (1)	CLOSE AUG 18 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	88 1/4	-8 1/4	-8.3
O	COMPUTER AUTOMATION	10- 19	19 1/4	- 3/4	-4.8
N	CONTROL DATA CORP	18- 27	29 1/4	- 1/4	-1.0
N	DATA GENERAL CORP	40- 80	48 9/8	+ 1/2	+1.0
O	DATAPOINT CORP	24- 48	34	-4 1/2	-11.6
O	DIGITAL COMP CONTROL	2- 7	3 3/8	0	0.0
N	DIGITAL EQUIPMENT	138-181	173 9/4	+9 1/2	+3.2
N	ELECTRONIC ASSOC.	2- 9	2 3/4	- 1/8	-4.9
A	ELECTRONIC ENGINEER.	7- 18	9 3/8	+ 1/8	+1.3
N	FOXBORO	28- 47	49 9/8	+1	+2.2
O	GENERAL AUTOMATION	9- 11	7 3/8	+ 1/8	+1.8
O	GRI COMPUTER CORP	1- 1	1/2	- 1/8	-20.0
N	HEWLETT-PACKARD CO	95-117	102	+ 3/4	+0.7
N	HONEYWELL INC	34- 30	47 3/8	+ 3/4	+1.8
N	IBM	227-280	279 1/2	+2 1/8	+0.7
O	MANAGEMENT ASSIST	1- 3	1 7/8	- 3/8	-16.8
O	MEMOREX	18- 33	28	+1	+4.0
O	MICRODATA CORP	10- 27	27 1/8	+ 9/8	+2.9
O	MODULAR COMPUTER SYS	5- 14	9 1/4	- 1/2	-8.8
N	NCR	24- 30	39	+1	+2.9
O	PRIME COMPUTER INC	4- 14	12	-1 1/4	-9.4
N	PERKIN-ELMER	19- 27	21	- 3/8	-1.7
N	RAYTHEON CO	45- 88	63 3/8	0	0.0
N	SPERRY RAND	40- 32	46 1/8	- 7/8	-1.8
O	SYCOR INC	20- 31	23	+ 1/4	+1.0
A	SYSTEMS ENG. LABS	6- 10	8 1/8	- 1/8	-1.9
N	VARIAN ASSOCIATES	13- 17	14 1/8	- 1/8	-0.8
A	WANG LABS.	11- 20	19 9/8	+ 3/8	+2.4

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE AUG 18 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 3/4	+ 1/4	+3.9
A	COMMERCE GROUP CORP	2- 3	2 1/2	- 1/8	-4.7
A	COMPUTER INVSTRS GRP	1- 3	2 1/4	+ 3/8	+20.0
N	DATRONIC RENTAL	0- 1	1 1/8	0	0.0
A	DCL INC	1- 1	9/8	-	-9.1
N	DPF INC	9- 8	7 1/8	+ 1/8	+1.7
A	GREYHOUND COMPUTER	3- 8	7 3/8	+ 1/4	+3.3
N	ITEL	8- 19	13	- 1/4	-1.8
N	LEASCO CORP	6- 18	18 1/4	- 1/2	-2.9
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	MRG INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/2	+ 1/4	+3.4
N	U.S. LEASING	7- 12	9 7/8	- 1/2	-4.8

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SOFTWARE & EDP SERVICES

EXCH		PRICE			
		1976 RANGE (1)	CLOSE AUG 18 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP.TECH	1- 2	2	+ 9/8	+43.4
O	ANACOMP INC	8- 11	8	- 1/8	-1.3
A	APPLIED DATA RES.	2- 4	4	+ 1/4	+6.8
N	AUTOMATIC DATA PROC	17- 39	32 1/4	-1 1/4	-8.7
O	COLEMAN AMERICAN COS	3- 8	2 1/2	- 1/4	-9.0
O	COMPUTER DIMENSIONS	3- 7	9 3/8	+ 1/8	+2.3
O	COMP ELECTION SYSTMS	3- 8	3 3/4	0	0.0
O	COMPUTER HORIZONS	1- 2	2	0	0.0
O	COMPUTER NETWORK	2- 6	3 3/8	+ 1/8	+3.8
N	COMPUTER SCIENCES	4- 8	8 3/4	+ 3/8	+9.8
O	COMPUTER TASK GROUP	1- 1	1 1/4	+ 1/8	+11.1
O	COMPUTER USAGE	3- 8	3 1/8	+ 1/4	+8.6
O	COMSHARE	2- 9	8	- 1/2	-7.0
O	DATA DIMENSIONS INC	2- 4	2 7/8	- 1/8	-4.1
O	DATATAB	1- 1	1 1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	17 1/4	+1 1/4	+7.8
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSTTE CORP	1- 3	1 1/2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	+ 1/8	+12.3
O	KEANE ASSOCIATES	2- 4	2 9/8	- 3/8	-12.3
O	KEYDATA CORP	2- 9	1 3/4	- 1/2	-22.2
O	LOGICON	4- 4	3 9/8	0	0.0
A	MANAGEMENT DATA	1- 3	2	- 1/8	-5.8
A	NATIONAL CSS INC	13- 23	22 1/2	0	0.0
A	ON LINE SYSTEMS INC	10- 22	21 3/8	+2 1/4	+11.7
N	PLANNING RESEARCH	3- 9	3 3/8	0	0.0
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 9	2 3/8	+ 1/4	+11.7
O	REYNOLDS & REYNOLD	13- 21	17 1/4	- 1/4	-1.4
O	SCIENTIFIC COMPUTERS	1- 1	3/4	+ 1/8	+20.0
O	TYMSHARE INC	10- 28	20 3/4	+ 1/2	+1.8
A	URS SYSTEMS	3- 9	4 1/4	+ 1/4	+6.2
N	WYLY CORP	2- 7	2 3/8	+ 1/8	+5.3

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE AUG 18 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	8 3/8	0	0.0
O	ADVANCED MEMORY SYS	4- 10	8 9/8	- 3/8	-8.4
N	AMPEX CORP	3- 10	8 1/2	- 1/8	-1.4
O	ANDERSON JACOBSON	2- 4	2 3/4	0	0.0
O	APPLIED DIG DATA SYS	13- 29	20 1/4	-1 3/4	-7.9
O	BEEHIVE MEDICAL ELEC	3- 8	8 1/2	0	0.0
A	BOLT.BERANEK & NEW	7- 11	9 3/8	0	0.0
N	BUNKER-RAMO	5- 10	8 1/4	0	0.0
A	CALCOMP	4- 7	9 1/4	- 1/4	-4.9
O	CAMBRIDGE MEMORIES	0- 8	9/8	- 1/8	-18.6
N	CENTRONICS DATA COMP	20- 10	32 3/8	-1 3/8	-4.0
O	CODEX CORP	22- 42	33	+2	+6.8
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 6	3 1/4	+ 1/8	+2.4
O	COMPUTER CONSOLES	4- 7	9 3/4	0	0.0
O	COMPUTER EQUIPMENT	1- 3	1 1/2	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	CONTEN	4- 9	8 3/4	-1	-12.9
N	CONRAC CORP	20- 25	22 1/8	- 3/8	-1.6
O	DATA ACCESS SYSTEMS	1- 4	9 1/4	0	0.0
O	DATA 100	7- 13	8 1/8	- 7/8	-8.7
A	DATA PRODUCTS CORP	5- 15	19 1/8	- 3/8	-4.3
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC	1- 2	1 1/2	0	0.0
O	DECISION DATA COMPUT	1- 4	1 9/4	+ 1/8	+7.8
O	DELTA DATA SYSTEMS	1- 1	1 1/8	+ 1/8	+12.3
N	ELECTRONIC M & M	1- 4	3 3/4	+ 3/4	+29.0
O	FABRI-TEK	1- 1	9/8	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/8	0	0.0
N	HAZELTINE CORP	4- 12	8 3/8	- 1/2	-9.4
N	HARRIS CORP	34- 99	92 1/4	-1 3/4	-3.2
A	INCOTERM CORP	9- 20	9 1/4	- 3/4	-7.9
O	INFOREX INC	3- 7	4	+ 1/2	+14.2
O	INFORMATION INTL INC	10- 18	11 9/8	+ 1/2	+4.4
O	INTEL CORP	40-109	63 1/2	+1	+1.3
A	LUNDY ELECTRONICS	4- 7	9 3/4	- 1/4	-6.2
O	MSI DATA CORP	3- 7	8 3/4	0	0.0
A	MILGO ELECTRONICS	19- 21	18 9/8	- 3/8	-2.2
N	MOHAWK DATA SCI	3- 10	8	- 1/8	-1.3
O	PENRIL CORP	1- 3	2 1/8	+ 1/4	+13.9
A	PERTEC CORP	3- 8	8 1/2	+ 3/8	+8.1
A	POTTER INSTRUMENT	2- 2	1 9/4	0	0.0
O	PRECISION INST.	5- 10	4 1/2	- 1/2	-10.0
O	QUANTOR CORP	4- 8	4 7/8	- 1/8	-2.9
O	RECOGNITION EQUIP	6- 11	8 1/8	- 1/8	-1.9
N	SANDERS ASSOCIATES	6- 11	8 1/4	- 1/4	-2.9
O	SCAN DATA	2- 4	2 1/8	- 1/8	-9.3
O	STORAGE TECHNOLOGY	9- 13	11 3/4	- 1/4	-2.0
O	T BAR INC	9- 10	9 9/8	- 1/8	-2.1
O	TALLY CORP.	4- 8	4 1/2	0	0.0
O	TEC INC	3- 9	3 3/4	0	0.0
N	TEKTRONIX INC	43- 87	83 3/4	-1	-1.3
N	TELEX	2- 9	9 1/8	- 1/8	-9.8
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 9/8	- 1/4	-8.8

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE AUG 18 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 3	3 1/4	0	0.0
A	BARRY WRIGHT	6- 10	7 3/8	- 1/8	-1.6
O	CYBERMATICS INC	1- 1	9/8	0	0.0
A	DATA DOCUMENTS	28- 42	28 1/2	- 9/8	-2.1
O	DUPLEX PRODUCTS INC	14- 24	14 1/8	- 3/4	-5.0
N	ENNIS BUS. FORMS	6- 8	6 9/8	- 1/8	-1.8
O	GRAHAM MAGNETICS	8- 13	8 3/4	+ 1/4	+2.6
O	GRAPHIC CONTROLS	13- 19	19 3/4	+ 1/4	+1.6
N	3M COMPANY	33- 83	83 3/4	+1 3/4	+2.8
O	MOORE CORP LTD	40- 91	40 3/4	- 1/2	-1.2
N	NASHUA CORP.	11- 18	17	- 1/8	-0.7
O	STANDARD REGISTER	15- 19	16	- 1/4	-1.9
O	TAB PRODUCTS CO	3- 11	9 1/4	+ 1/4	+2.7
N	UARCO	21- 29	21	0	0.0
O	WABASH MAGNETICS	4- 8	7 1/8	0	0.0
N	WALLACE BUS FORMS	19- 23	21	+1 1/8	+9.6

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[illegible]	[illegible]	[illegible]

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices

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ear August 30, 1976 Vol. X, No. 35

NEWSPAPER

FCC Postpones Datran Closing; Users Covered Until Sept. 15

WASHINGTON, D.C. – The Federal Communications Commission (FCC), which has fostered the growth specialized common carriers, moved here last week to protect customers of the first operational system to fail.

Just 24 hours before service was to be shut down on Thursday, the FCC ordered Data Transmission Co. (Datran) to remain operational until September 15 or until all users could find alternative services, whichever is first.

At a Thursday afternoon board of directors meeting – called primarily to formally declare bankruptcy – the Datran board voted to go along with the FCC request. In its order, the FCC granted Datran's request to end service, but said the firm had not given users sufficient notice.

At the same time, the commission ordered Wyly Corp. – Datran's parent company – to forward the funds needed to keep Datran operational for the 20-day period.

Last week at the deadline for service cutoff, the Datran and Wyly boards agreed to advance $250,000 in order to keep the network operational.

The money will go to an operating receiver which will maintain the Datran network temporarily.

The FCC earlier on Thursday had asked a federal district court judge in Alexandria, Va. to restrain Datran from going bankrupt unless the firm guaranteed to continue operations.

When Datran and the Wyly board agreed to fund the continued operation the point was moot.

Dream Dead After Eight Years; Wyly Determination Not Enough

By E. Drake Lundell Jr.
Of the CW Staff

The computer community "must take the initiative in demanding better data transmission service from the existing telephone and telegraph carriers. We must also take the initiative in seeking alternatives." Sam Wyly, May 5, 1970.

"Despite the determined efforts of the FCC [Federal Communications Commission] to foster full and fair competition in the telecommunications marketplace, the telephone monopoly continues to be the dominant force." Sam Wyly, Aug. 19, 1976.

VIENNA, Va. – A lot of water has flowed under the bridge in the six years between the time Sam Wyly keynoted the 1970 Spring Joint Computer Conference and the time he announced the closing of Data Transmission Co. (Datran), his firm's entry into the fledgling market for specialized common carriers.

And for most of that time Sam Wyly has been juggling, reorganizing and selling parts of his Wyly Corp. empire just to keep Datran, which pioneered the idea of an all digital network for communications, afloat.

Now the idea is dead as Wyly Corp. closed Datran's operation on Aug. 19, giving users just a week to find other sources until prodded by the FCC to extend the deadline.

Over the eight year life of Datran almost $100 million had been pumped into the firm, largely from Wyly Corp. and from one other investor, Walter Haefer Holding AG of Zurich, Switzerland.

But even at tbe height of its operation – just before it closed the doors – the digital data transmission network had attracted just 150 users and was generating only $400,000 in billings each month.

In announcing the closing of the operation, Datran immediately laid off 200 people; it kept just 40 on the staff for one week in order to keep the network operational so users might find other sources for their data communications operations.

However, one week is little time for configuring a data communications net-

(Continued on Page 4)

Cites New Price/Performance

Univac Drops Series 90 Prices

By Molly Upton
Of the CW Staff

BLUE BELL, Pa. – Univac Series 90 machines will carry lower price tags as a result of reduced memory prices reflecting the use of 4K MOS memory throughout the line.

Along with a performance enhancement feature for the 90/60 and a CPU price drop on the 90/70, the memory price cuts have "significantly improved" the cost/performance ratios of the systems, Univac said.

The moves, intended to make the Series 90 a competitive alternative to IBM's 370/138 and 370/148, include reductions in both purchase and lease prices.

Some of the features included in the Univac announcement are:

- Reduction of the 90/70 CPU purchase price by about 25%.
- Reduction of the 512K 90/60 system purchase price by about 45%.
- Availability of 4K MOS memory for the 90/30, 90/60 and 90/70.
- Field upgradeable additional memory capacity on the 90/30, 90/60 and 90/70.
- A 90/60 performance enhancement package that is said to provide a 25% increase in instruction execution speed.
- Reduction of rental and purchase prices of the 90/80's 512K increment memory by 42% and 57%, respectively.

The 90/30 memory capacity has been doubled to 512K bytes, although it can be contained and powered within the CPU, Univac said. Price reductions range up to 19% for 90/30 main storage and apply to increments of 65K or more.

With the larger memory, performance of the IMS/90 can be improved when used in an application mix of an on-line management information system and conventional batch programs by decreasing terminal response times and increasing throughput by supporting more levels of

(Continued on Page 2)

Datran Users Seek Nets As Data Carrier Goes Broke

A CW Staff Roundup

Users, government officials and the shattered remnants of Data Transmission Co.'s (Datran) management searched frantically for alternatives last week in the wake of the firm's decision to discontinue data communications services as of 5 p.m. Tbursday.

Giving users only seven days' notice, Datran said it would go out of business due to financial problems which have beset the firm for the past eight years.

While the remainder of Datran management pushed for bankruptcy and Federal Communications Commission (FCC) attorneys debated whether they could force the firm to continue operating, most users contacted were able to find at least short-term solutions to their most pressing problems.

Reactions ranged from philosophical to bitter. Almost all users contacted last week reported an excellent response from AT&T and the specialized common carriers who tried to configure systems and deliver equipment to keep them going after all the Datran lines were scheduled to go dead. But most ended up with AT&T since only it could promise quick delivery local loops.

Reaction of Shock

Users at Options Clearing Corp. in Chicago "were shocked that a company like Datran could pull the switch on service with only four [working] days' notice," according to Jack Pecot, vice-president for DP.

"We read about it first in the *Wall Street Journal* and then called Datran to find out what the story was," he said.

The clearinghouse had been using a 56K bit/sec digital line from Datran between Chicago and New York and two 9,600 bit/sec lines between Chicago and San Francisco to transmit data.

Pecot contacted some "higher ups" at Western Union as soon as the Datran announcement was confirmed. Western Union service personnel worked all weekend to bring up service, promising to turn over lines for testing by last Thursday, Pecot said.

Coverage of Datran closing continues on **Pages 4** and 5.

Because of the critical nature of the clearinghouse's transmissions, "we were thinking of getting a temporary restraining order forcing Datran to stay in business until 9 a.m. Friday.

"We're 100% confident of getting up on Western Union" for processing Friday night's work and transmitting Monday, Pecot said. But he wasn't so sure about Thursday at 5 p.m.

Besides inconvenience, however, the changeover will cost the clearinghouse 35% to 50% of its annual teleprocessing budget, Pecot estimated.

Reacted With a Scream

At Panasonic headquarters in Secaucus, N.J., Fred Ilardi, general manager of DP, said his initial reaction was to scream.

And scream he did, all the way to the FCC in an attempt to convince it of the necessity for uninterrupted operation.

Ilardi has an on-line accounts receivable system operating over two circuits connecting nine cities.

Panasonic has ordered gear from AT&T. Although it is more expensive than other competitors, Ilardi said he felt he had no choice since the others depended on AT&T to supply the local loops.

He had scheduled a meeting with AT&T representatives prior to the Datran announcement. Within one day, AT&T had one leg in place and was working on the key local loops, he said.

In the interim he flew billing personnel

(Continued on Page 3)

Software Untaxable: Tenn. Court

By Don Leavitt
Of the CW Staff

NASHVILLE, Tenn. – Software programs acquired by a user from an outside source are intangible personal property – regardless of how they are transmitted – and therefore cannot be taxed under the Tennessee Sales and Use Tax Law, according to a decision handed down by the state supreme court here.

Ruling for the Commerce Union Bank and against the commissioner of revenue, Judge William H.D. Fones said "what is created and sold here is information."

The "tangible reel of tape" used to transmit the programs from the originator to user – the crux of the state's case – is "merely incidental," especially since it wasn't even retained by the bank, the judge added.

The decision sets a precedent. While other court cases have been concerned with software and property taxes and with patent protection, Commerce Union Bank vs. Tidwell is the first case at a state supreme court level to consider the application of sales and use tax statutes to programs, according to attorney Alfred E. Abbey of Trabue, Sturdivant & Dewitt, who argued the case for the bank.

In its case, the state argued that the purchase of software was "analogous to the purchase of a phonograph record or the purchase or lease of a motion picture film" which had already been ruled tax-

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy; $15 a year in the U.S.; $23 a year for Canada and PUAS; all other foreign, $40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to Walter Boyd.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160.

Expands Memory Limits

Univac Lowers Prices on Its Series 90

(Continued from Page 1)

multiprogramming, the firm said.

Systems up to 256K are being shipped currently with the new MOS circuits and deliveries of 90/30s with memory above 256K will begin in the fourth quarter of 1976. For expansion above 256K, there is a field installation charge of $400, a spokesman said.

The type of memory provided to the user depends on the age of the processor and the amount of expansion involved.

On an older processor going above 256K, the memory will be replaced with 4K chips; whereas in expanding up to 256K, the memory will consist of either additional 1K chips or replacement with 4K chips, depending on availability, he said.

Recent processors will be accommodated by the addition of 4K chips without any replacement of existing memory, he said.

Univac said modifications of the 90/60 have "significantly improved its price/performance ratio and placed it competitively in the gap between" IBM's 138 and 148.

"A typical configuration of the 90/60 is more powerful than a comparably priced 370/138," Univac claimed.

Univac has spruced up its 90/60 by quadrupling its memory capacity to 2M bytes of MOS memory, cutting the purchase prices on a 512K system by 45% and dropping the five-year lease price tag 21% below previous charges on comparable systems.

The new prices for a 512K 90/60 memory/CPU complex, including selector channel and a 1 byte multiplexor channel, are for $7,894/mo including maintenance, on a five-year plan.

In addition, the firm is offering a performance enhancement feature which will provide a 25% increase in instruction execution speed, according to the firm.

This kit leases for $238/mo including maintenance; sells for $9,000. It embodies enhancements to the micro logic, a spokesman said.

The minimum main memory size for a 90/60 is now 512K bytes rather than 128K for OS/4 systems and 256K for VS9 systems, a spokesman said.

Add-on memory increments of 256K bytes lease for $1,305/mo each, including maintenance on a five-year plan. The purchase price is $46,800 for each increment, Univac said.

The typical monthly lease for a 90/60 with 512K bytes of main storage, 600M bytes of auxiliary disk storage, four tape units and a standard complement of unit record peripherals is $20,534.

The main memory capacity for the 90/70 has been doubled to 2M bytes.

Prices for the 256K-byte increment of main storage for the 90/60 apply to all increments above 512K bytes in the 90/70, Univac said.

In addition, the purchase prices on 90/70 processors and processor features have been reduced by about 25%.

The monthly lease charge for a typical 90/70 is $35,965 for a 1M byte unit with 1,200M bytes of auxiliary storage, six tape units, multiple printers and standard unit record equipment. The purchase price is $1.5 million.

On the 90/80, which was announced with the 4K memory, prices for main storage above 1M byte have been reduced. Previous rental charges for 512K of storage have been reduced by 42%. The purchase price of these increments was slashed by 57%.

For example, the five-year lease price, including maintenance, for a 512K-byte increment is now $2,687/mo and the purchase price is $96,300.

The 90/70 and 90/80 now bracket the 148 in performance and price.

Software Untaxable: Tenn. Court

(Continued from Page 1)

able under Tennessee law.

Fones rejected that concept, noting that motion picture film is different because it is inherently related to the movie itself and without the film there can be no movie.

Neither magnetic tape nor cards are crucial in software; a program could be transmitted orally or electronically without any tangible evidence of transmission.

The state did not try to "tax computer programs purchased by [the bank] which were transmitted to its computers from outside the state by way of telephone lines," Fones noted.

"That method of transmission, without question, constitutes the purchase of intangible personal property," he continued. "The principle is the same, only the method of transmitting the information differs" when tape is used, he added.

As a result of Fones' ruling, the bank recovered $4,000 in sales taxes collected from it for use of several software packages from 1968-1971. Although the money involved is small, the principal involved is substantial and should have applicability across state lines, Abbey said.

Writing about the case in *Computer Law and Tax Report*, attorney Robert Bigelow, agreed. Summarizing several cases, he showed how the definition of tangible personal property – and presumably, by extension, the definition of "intangible property as well – has differed from state to state till now.

But he closed with a call to his readers to "act now . . . if you have paid sales, use or property taxes on programs, talk with your tax department as soon as possible to see if it is practical . . . to claim a refund."

The Nashville bank's battle started as a result of an audit by state tax officials in late 1971. As a result the bank was assessed a deficiency for various things including the programs Commerce acquired during the 1968-71 period.

Conferences between the bank, its council, and the state lasted six months and cleared away most of the items. However the status of the purchased software, which included both utility and application packages, could not be resolved that way.

Commerce Union paid the demanded tax under protest and filed suit in mid-1972 to recover it through the courts.

The Chancery Court for Davidson County ruled in favor of the state, based on the movie film analogy. The bank appealed.

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Datran Users Scramble for Alternatives As Net Dies

(Continued from Page 1)

from Chicago and Atlanta to Secaucus where they began inputting accounts receivable on CRTs connected to the local CPU. Response time on the Datran net had deteriorated to between 15 to 20 minutes, he observed.

Initially, AT&T was quoting 17 to 20 working days to get Panasonic's network in place. However, that was expedited considerably, he said, adding he wasn't sure if the pressure came from the FCC or from his use of AT&T executive names.

Personally Distressed

At American Hospital Supply Corp. in Waukegan, Ill., Ralph Wallio, DP manager, said he was personally distressed about the Datran failure since it "doesn't say much about the maturity" of the data communications field.

His firm had been planning to expand its use of Datadial and make greater use of its full capabilities, but now it will be restricted to "more conventional" types of service, he said.

American, Wallio said, had been aware of Datran's financial position, adding that staying with the firm was a "calculated risk." But at the same time, they were happy with the service.

American had about 100 terminals in the field, split equally between Bell facilities and Datran facilities, he said. Seventy-five percent of the data actually went over the Datran circuits, accounting for 60,000 connections each month.

"It was a very cost effective and operationally effective service," he said. "It will be missed."

The firm is switching back completely to Direct Distance Dialing from Bell, he said, noting that Bell's response had been "excellent" and he anticipated no crisis when the Detran system stopped operating.

Republic Financial Services in Dallas had been able to solve the problems of its 24-hour dedicated lines through a hookup with Southern Pacific Communications Corp. (SP) and Bell local loops, according to spokesman Don Eisan.

But by mid-week the firm was still wondering what to do with its batch lines, he said.

Eisan said he was "disappointed" by the move because he felt the Datran service was "far superior" to that offered by Bell and it also cost less.

At the time of the shutdown the firm was running 80% of its data on Datran, but had more problems with the 20% that was on the Bell network, Eisan said. "Now I'm worried," he said in reference to the greater reliance the firm will now have on Bell.

"We never had one or two hour service delays with Datran," Eisan added, noting that delays of even longer were common with Bell.

Republic operated 21 terminals in the field on four dedicated Datran lines, he said. The savings had been worth the risk faced by going with an independent vendor.

The response from SP had been excellent in trying to solve the problems raised by the Datran closing, he said. However, he added, it was hard to get Bell even "to return my phone calls."

"Not confident," but feeling better than when the announcement was first made, Ken Behling, data center manager at Taylor Forge, a Chicago subsidiary of Gulf and Western Industries, Inc., said last Wednesday he was working with both SP and AT&T to have his system ready to operate when Datran closed down.

'Panic and Confusion'

There was "panic and confusion" when Taylor first got the message he said, noting the firm had heard about the Datran shutdown secondhand and not from Datran itself.

The firm had been operating three Datran Datadial links and one Datran leased line, with two of the Datadial links having low-speed Bell backup. The Datran leased line operated at 9,600 bit/sec and the firm may have to go to 4,800 bit/sec lines from Bell, he indicated.

Personally, he said, the experience with Datran had made him leary of the specialized carriers indicating that he felt many users would now fall back on Bell for all their communications needs, hurting the remaining specialized carriers.

At the same time, however, Behling said the specialized carriers offered real dollar savings to users, but in the future they might have more backup for their systems.

He also indicated that Datran had not been "that great" on its dial-up service and its leased line operation was just equal to or a little better than the Bell offerings, even though the Datran service cost less.

Bell seemed to have a shortage of modems, Behling noted. When the Datran announcement was first made, he said Bell quoted a two to three week wait for delivery, but early last week said they would be able to get them in by the deadline for Datran's closing.

"We'll have substantial problems if we don't get them," he added.

At Data Resources, Inc. in Lexington, Mass., the Datran lines were already on their way out the door when the announcement of the shutdown hit.

Don Lanoue, manager of telecommunications service, said he was dissatisfied with the Datran service and felt the system was "not reliable."

Previously the firm had Bell leased lines backing up the Datran network and ordered a Dataphone Digital Service link to replace a Datran 208 link the day the announcement was made, he said. Bell installed a 9,600 bit/sec link to Washington, D.C. within four working days, he noted.

Lanoue said he was not disappointed at the Datran failure, since his firm had had "a lot of grief with Datran." He noted that the Datran service personnel in the Boston area were "excellent," but the service in New York and Chicago was bad. "Taking five hours to fix a problem is ridiculous," he said.

At McDonnell Douglas Automation Corp. in St. Louis, there won't be any problems because Datran was being used in parallel with leased lines, according to William Harris, communications manager.

'Didn't Burn Bridges'

"We had a number of lines in on an experimental basis to a number of our McAuto sales offices where we have terminal equipment, but it was experimental and I didn't burn any of my bridges behind me," he said.

LOOK T.M.

FOR REAL-TIME PERFORMANCE EVALUATION

APPLIED DATA RESEARCH introduces the LOOK System for real-time performance measurement of OS/VS systems (MVT, SVS, and VS1).

LOOK uniquely overcomes critical weaknesses of existing software monitors:

- LOOK provides immediate results via operator console or user terminals (i.e., ROSCOE & TSO).
- LOOK does not encroach upon system resources. It needs only 1/10 of the overhead of comparable systems.
- LOOK is easy to use. Simple to install. It becomes a valuable performance measurement tool immediately.
- LOOK includes facilities to dynamically correct system imbalances which result in reduced throughput.

LOOK COMMANDS

LOOK's immediate-response capabilities are activated by straightforward commands, entered from any operator console. These commands summarize the following system elements:

- CPU Utilization
- I/O Activity
- Paging Activity (VS only)
- Wait Conditions
- Job/Device Associations
- Control Block Information
- Core Usage

Two other LOOK commands permit immediate action to correct system malfunctions. You may dynamically change a job's dispatching priority during execution to eliminate the monopolizing of system resources by high-priority jobs. And you can cancel most jobs not cancellable via the analogous OS or VS cancel command.

Since LOOK is a command, it requires no resources when not being used. Its capabilities are instantly available when you need them. The console display of pertinent data on system performance enables immediate identification of "hidden" problems which cause visible symptoms of poor performance. Like slow turnaround. Frequent system hangs. And sluggish processing.

Specific problems which LOOK diagnoses include:

- Channel, Device, or File Contention
- Thrashing and Excessive Paging
- Excessive Arm Movement
- High-Priority, CPU-BOUND Jobs
- Program Loops
- Core Fragmentation
- Exclusive use of data sets
- Waiting for shared DASD
- Lost I/O Interrupts

LOOK offers hardcopy output known as the LOOKLOG. It automatically executes LOOK commands over an extended period of time and documents system performance. This documentation represents a complete "snapshot" of overall performance for detailed, in-depth systems study.

Advantages of LOOK's numerous applications include:

- Instant Information—Pertinent performance data is obtained when it is needed most—when a problem occurs.
- Invisible Problem Identification—"See" hidden aspects of a system's operation which may be the unsuspected problem source.
- Simplicity—LOOK is quickly installed, easily used, and immediately beneficial.
- Validity—LOOK reports totally accurate and realistic data.
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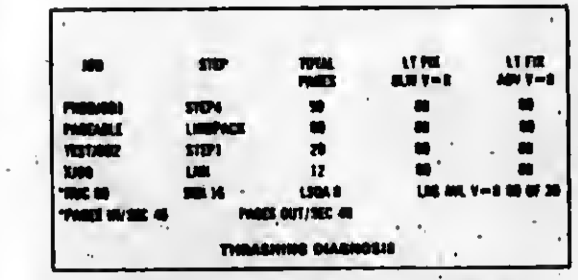
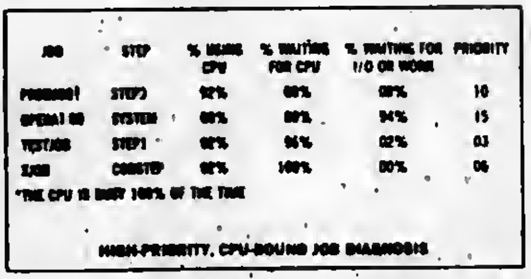
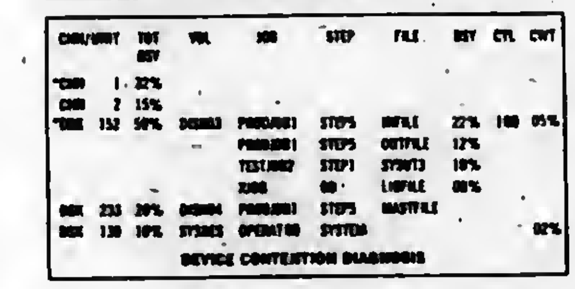
LOOK is currently operational in over 40 sites under MVT, VS1, and VS2, with future availability planned for MVS. LOOK is also operable under TSO in operator mode and ROSCOE (Version 3.3).



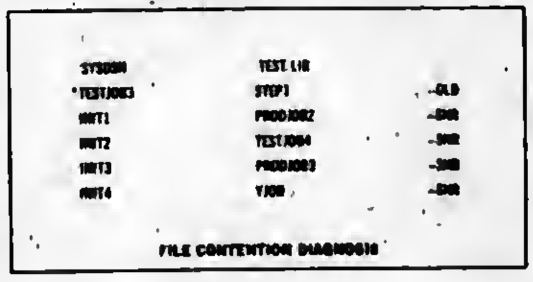
THRASHING DIAGNOSIS



HIGH-PRIORITY, CPU-BOUND JOB DIAGNOSIS



DEVICE CONTENTION DIAGNOSIS



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AT&T Suit Worries Ford Appointee

WASHINGTON, D.C. – The new chief of the White House Office of Telecommunications Policy (OTP) questioned the wisdom of the Justice Department's antitrust suit against AT&T here last week.

"A good question to ask Attorney General Edward Levi is: Did the Justice Department look at the economic consequences of that action before it brought the suit?" Thomas Houser told reporters here.

Sources believe the remark was politically motivated – to make President Ford look "more neutral" on the issue since the former OTP head already supported the suit and Democratic presidential contender Jimmy Carter recently came out in favor of it.

Until recently Houser was a partner in Sidley & Austin, but said he did not work on the antitrust suit it is handling for AT&T.

Rivals Ponder Supporting Datran System

By Molly Upton

Of the CW Staff

At least two of the other specialized common carriers drew up plans to offer to run Data Transmission Co.'s (Datran) network on a temporary basis and to provide users a chance for an orderly transition to other carriers.

But the sudden flight to American Telephone & Telegraph (AT&T) by many large Datran users caused Southern Pacific Communications Co. (SP) to shelve its plan to operate the entire network for 45 to 60 days, according to Rex Hollis, SP vice-president of marketing.

MCI Communications Corp. submitted an offer to the Federal Communications Commission (FCC) at the FCC's behest to run the Datran network on a temporary basis, according to John Worthington, vice-president and general counsel.

Because SP depends on Datran's Kansas City-St. Louis link to provide service to its own customers, it is prepared to go "to any reasonable length to keep that section up and running," Hollis said.

The motivating factor behind the plans of both SP and MCI was the good of the industry, Hollis and Worthington said.

"It was absolutely imperative that there be some alternative available to these people and we just felt that certainly the industry would suffer if these people were left high and dry," Hollis explained.

The SP plan was conceived over the weekend following Datran's announcement last Thursday of its plans to cease operations.

Large Users Elected AT&T

But when SP started calling large Datran customers Monday morning, it found many of the large users had elected to use AT&T services. The users told SP that AT&T had promised to try to get them in service by last Thursday or Friday.

The exit of large users from the Datran net made the idea of operating the net unfeasible to SP, Hollis said.

Hollis said SP had in fact considered long and hard the prospect of buying the Datran system before the closing announcement came.

SP regretfully concluded it could not make the network a profitable venture and rejected the idea, he said.

However, "we definitely intend to ask for permission to continue to operate the portion from Kansas City to St. Louis and are going to apply to the Federal Communications Commission for emergency authority to do that.

"We have a great number of our own customers over that route. We want to step in and pick it up just to make sure that portion of it doesn't go down."

SP is willing to assume full responsibility for the link, including paying bills from the day it begins operations, he said.

Hollis explained that is the only portion of the Datran net it intends to operate. SP has asked to lease that portion from Datran, he added.

SP has not as yet offered to buy that portion of the net, since the whole matter is so unsettled, Hollis said. He also doubts it would be for sale since the whole Datran backbone system goes through there.

Wyly's Net Dies Painful Death

(Continued from Page 1)

work that may have been years in the making as users found out last week as they raced against the 5 p.m. Aug. 26 deadline (see related story this page).

Not Unexpected But a Shock

The move was not entirely unexpected, but it was a shock nonetheless.

As one long-term employee said last week: "We knew the company was on the brink but it has been there before and something always happened at the last minute to keep us from going over."

In the corporation's 1975 annual report, Wyly warned "it is not an overstatement to say" a proposed refinancing plan "is a survival plan for Wyly Corp."

At that time the firm was trying to restructure its debt so that $108 million of it – largely caused by Datran – would be turned into equity within the corporation. That restructuring is still underway at Wyly; its fate remains in doubt with the closing of Datran.

Wyly also reported in the annual report that "during the past few years of financing Datran we have not been able to meet interest and principal payments out of operations. The cash has been generated largely by the continual (and sometimes costly and painful) sale of assets."

In spite of some of the company's moves to reduce debt, in April 1976 Wyly wrote: "Our costs are still unmanageable in view of our foreseeable inability to pay them. Our cash needs remain pressing and substantial."

In addition, the firm had been actively trying to sell Datran for the past six months and had even offered to let it go for nothing – if a buyer would assume the massive debt of the company.

All that is a far cry from the brasher Wyly that keynoted the Spring Joint Computer Conference back in May of 1970.

At that time, Wyly, who was just getting his feet wet in data communications, indicated that the foremost problem facing computer users "is the bottleneck in data transmission," adding that "the absence of reliable, high-speed, low-cost access to computers and data banks has led us to the brink of disaster.

'Confronted With a Crisis'

"We are confronted with a crisis in data transmission," he said then. "It will lead us to a national crisis. The crisis in data transmission will slow the growth of an economy which is now based on knowledge."

"Whatever slows the use of computers, slows not just the sale of them, but the social and economic growth of all businesses, of all the professions, indeed, of all nations that look to the computer as an incomparable instrument in human service."

That challenge to the computer community was far different from Wyly's final word last week.

In a statement prepared for release when the firm formally declared bankruptcy in federal district court on Friday, Wyly said: "Our efforts to secure financing necessary to continue the business of Datran were seriously impaired as a result of AT&T'a [American Telephone and Telegraph] action to institute services at rates which were about 40% below Datran's rates.

"In June of this year administrative law judges of the Federal Communications Commission found certain of such AT&T rates to be unlawful, unreasonably low, anticompetitive, predatory and specifically designed to eliminate Datran.

"That Datran has indeed been eliminated is now a fact. The cause has been documented. We now look to the court for justice in this matter."

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Antitrust Violations Charged

Wyly Corp. Sues AT&T, Seeks $285 Million in Damages

WASHINGTON, D.C. – Wyly Corp. has filed suit against American Telephone & Telegraph Co. (AT&T) for allegedly keeping its subsidiary, Data Transmission Co. (Datran), out of the data transmission and digital data transmission services market in violation of federal antitrust laws.

The suit, filed in U.S. District Court here, seeks $285 million in damages.

The action was brought by Wyly on its own behalf as Datran's majority owner and also as assignee of Datran after announcing its intention to cease operation.

The suit charges AT&T and its associated operating companies with possessing monopoly power in providing data transmission services in violation of the Sherman Antitrust Act and using this monopoly power to impose predatory rates and practices to block competition.

Specific Violations Cited

The complaint alleges five specific violations:

- Monopolization of data transmission services.
- Attempt to monopolize data transmission services.
- Attempt to monopolize digital data transmission services.
- Combination and conspiracy to monopolize data transmission and digital data transmission services.
- Combination and conspiracy in restraint of trade.

Wyly charged further that AT&T has used its monopoly power to engage in deceptive marketing techniques and false predictions to customers concerning availability of its own digital data transmission services. Wyly also charged AT&T with granting or withholding services to actual or potential data transmission service customers and instituting and proposing unreasonably low rates for data transmission services predicated on false or misleading analyses.

The suit also charged AT&T with establishing unreasonable conditions under which it and its operating companies deal with Datran and its customers that place Datran at an unfair competitive advantage. It further charged AT&T with barring Datran's entry into the data transmission business.

Specifically, the suit alleges that AT&T established rate structures resulting in "unreasonably high" charges to Datran for leasing an interconnecting local transmission line or "local loop." AT&T was additionally charged with refusing to lease long distance lines to Datran and its actual or potential customers or establishing wholesale rates for long lines high enough to exclude competitors from providing services at competitive retail prices.

Monopolizing the Marketplace

The complaint also charged AT&T with monopolizing the marketplace for data transmission and digital data transmission services.

According to Wyly, these services can be provided on the basis of "private line" service, consisting of data circuits leased to users for communication between the designated points; and "switched" service, in which a user may be connected to any other user on the system.

Wyly charged that AT&T has been able to obtain more than 90% of all revenue generated by data transmission services because of the dominance of its nationwide telephone network.

'Wholly Without Merit'

AT&T's attorneys are studying the complaint. Based on their initial look as well as press reports and past allegations by Datran, they believe the charges are "wholly without merit," according to Larry Coffin, AT&T press relations manager.

Datran was founded in 1968 and licensed as a specialized common carrier devoted to data transmission. Unlike AT&T, Datran provides no voice communication service.

Certain rates for AT&T's digital data transmission have been found anticompetitive by administrative law judges of the Federal Communications Commission (FCC).

In particular, the rate for data under voice/dataphone digital service was offered by AT&T 40% below those set by Datran.

On June 22, 1976, the FCC's administrative law judges ruled these data transmission rates unlawful, unreasonably low, anticompetitive, predatory and specifically designed to eliminate Datran.

"In its haste to accelerate its program for data transmission participation and its zeal to develop extremely competitive rates for digital data service, AT&T has deliberately understated the actual cost of providing that service. This resulted in the development of a DDS [Dataphone Digital Service] test rate about half of Datrans' end-to-end charges," the judge said.

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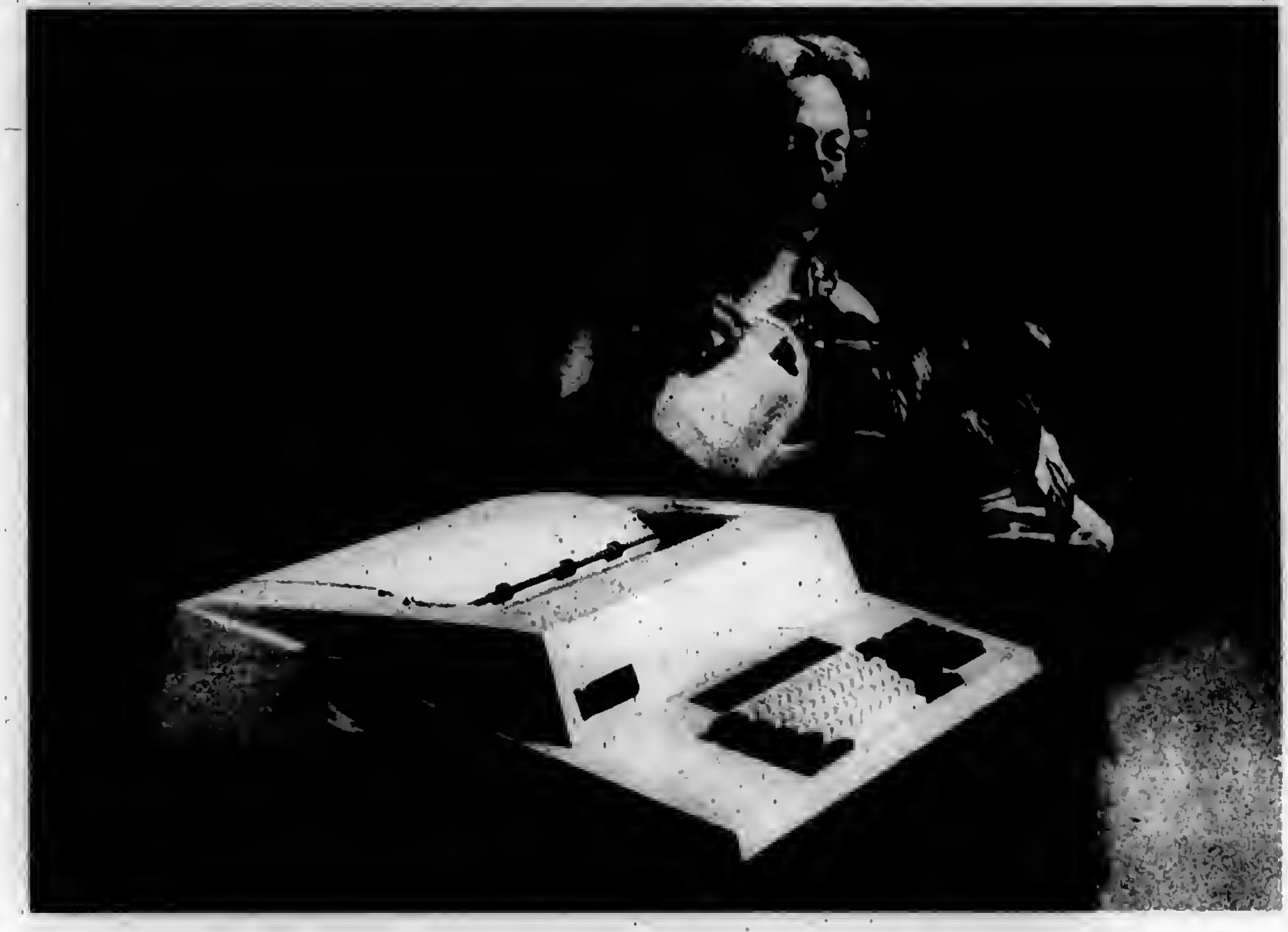

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French Cabinet Approves Bill Proposing Privacy Legislation

PARIS – A privacy bill, limiting the use of computerized personal information in both the public and private sectors, has been adopted by the French cabinet and will be presented to Parliament this fall.

The bill provides for a national privacy commission similar to the UK's Data Protection Authority to control use of personal information. To be known as the Commission Nationale Informatique et Libertes, this body of 12 commissioners would be composed of representatives of the government, the legal profession and the DP industry, according to *Computer Weekly*.

While both public and private sectors will be regulated by the commission, they will be treated differently under the proposed law.

The private sector will be required only to submit to the commission details of any planned systems containing personal information. These applications will be made public by the commission.

However, the commission will have a veto power over systems proposed by government agencies, *Computer Weekly* said.

Individuals will have the right to access information about themselves in computer files kept by both government agencies and private organizations except for medical information, which will be provided to the individual via his physician.

Other exceptions have been included for files involving defense and national security, the bill said.

Subjective information, such as religious and political beliefs as well as racial origins, will not be permitted to be included in such files under the proposed law and police would be the only sector with access to criminal records. Manual files are not covered by the bill.

Individuals who violate the law could face prison sentences of up to five years and fines of up to two million francs ($400,000), according to French Minister of Justice Jean Lecaneut, who stressed that the bill is in no way intended to stifle the DP industry.

FEC and NBS to Host Election Symposium

GAITHERSBURG, Md. – The Federal Election Commission (FEC) and the National Bureau of Standards (NBS) will host a one-day symposium on the use of computers in the elections process on September 10.

The program includes an overview of the status of computerized elections in 1976, a live demonstration of various voting equipment and a choice of two two-hour tutorial sessions on the following subjects:

- Cost, obtaining expertise and public acceptance.
- Conducting a computerized election.
- Training, equipment malfunctions and scheduling services, supplies services and personnel.
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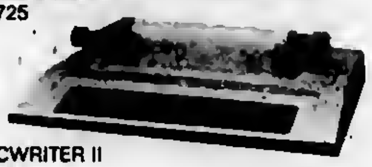

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Maryland DP Professors Refuse To Participate in Exchange Plan

COLLEGE PARK, Md. – Computer scientists are among those at the University of Maryland here who have stated they would refuse to receive Soviet scientists participating in an international exchange program until the Soviet Union exhibits a willingness to live up to the principles of free scientific exchange.

In a letter to the executive director of the International Research and Exchanges Board (Irex), the chairman of the departments of computer science, physics, chemistry, geochemistry, mathematics and the Institute for Fluid Dynamics denounced the Soviet government's policy on scientific exchange.

Irex coordinates international exchange programs for scientists.

The letter cited the case of Prof. Benjamin Levich, a member of the USSR Academy of Sciences, who has repeatedly been denied permission to emigrate to Israel and now to teach at the University of Maryland's physics department.

The university's ban on participation in the Irex program excludes those Soviets specifically invited by colleagues at Maryland.

The letter complained scientists authorized by the USSR to participate in the exchange were not those invited by the university, but rather those selected by the Soviet government.

Were Levich allowed to visit the university, the six department chairmen would consider it a demonstration of true interest in free exchange on the part of the USSR, they said.

Compcon Set to Open Next Week in D.C.

WASHINGTON, D.C. – Compcon 76 Fall, the IEEE Computer Society conference to be held here Sept. 8-10, will be oriented toward system engineering and offering practical solutions to real problems, IEEE said.

There are two preconference tutorials planned for Sept. 7. "Designing with Microprocessors: A Hands-On Workshop" will permit attendees to solve design problems in a variety of microprocessors using actual hardware. The other tutorial will explore structured programming.

The conference will open Sept. 8 with a plenary address by Walter W. Galvin, chairman of the board of directors at Motorola, Inc.

Technical sessions for the conference will be organized into five categories: computer applications, microprocessors, computer system technology, software and components technology and memories.

Under the computer applications group, energy systems, law enforcement systems and computers in education will be covered. The architecture, software, applications and design aids of microprocessors will be examined under this group.

Computer system technology will include sessions on security, practical applications of performance evaluation, innovations in system architecture, distributed systems and networks and problem partitioning for distributed systems.

Subjects to be discussed under the software sessions will include software design methodology, software cost estimating and sizing, software visibility and control, and reliability and quality assurance.

Components technology and memories will cover advanced MOS components technology, state-of-the-art semiconductor memory technology and advanced solid-state memory technology.

Also included in the conference program will be a series of "Great Debates" on centralized vs. distributed processing and the limits of software reliability.

For further information, contact IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

Security Workshops Slated

PHOENIX – Honeywell will continue its workshops on computer security and privacy with four sessions here this fall.

The three-day workshops are scheduled for Sept. 28-30, Oct. 19-21, Nov. 16-18 and Dec. 7-9, according to Jerome Lobel, Honeywell computer security manager and organizer of the sessions.

Participants will examine actual cases of breaches of security or privacy in major DP installations, he said.

The registration fee for each workshop is $350. Additional details are available from Lobel at Honeywell, P.O. Box 6000, Phoenix, Ariz. 85005.

System Turns Papers Into Braille

WAUSAU, Wis. – Bus schedules, telephone directories, reference works and study aids for school are now being provided In Braille for blind people thanks to a computer at North Central Technical Institute (NCTI) here.

The Braille Print Center at NCTI uses an IBM 370/115 to prepare any document a visually impaired person needs. The system produces a page of Braille in six seconds, according to Dr. Russell Paulsen, administrator of the research department.

The system can prepare Braille documents from a variety of source material, including typed copy, magnetic tape or punched cards, which is entered into the system to produce documents in Grade II Braille, a form of Braille similar to shorthand.

The system also accepts material prepared and edited via a CRT.

The computer edits the information into the proper format and produces it on a printer modified to handle Braille.

"We are offering this service to visually impaired people across the nation," Paulsen said. "These people need certain documents on the job that sighted people take for granted.

"Only about 1% of the material printed manually is ever put into a form visually impaired readers can use. Much of it could easily be printed in Braille by a computer. This includes documents prepared by the Government Printing Office and college libraries," he said.

To develop the Braille Print Center, the school obtained funds under the federal Vocational Education Act of 1968 and from a grant from the Wisconsin Board of Vocational, Technical and Adult Education.

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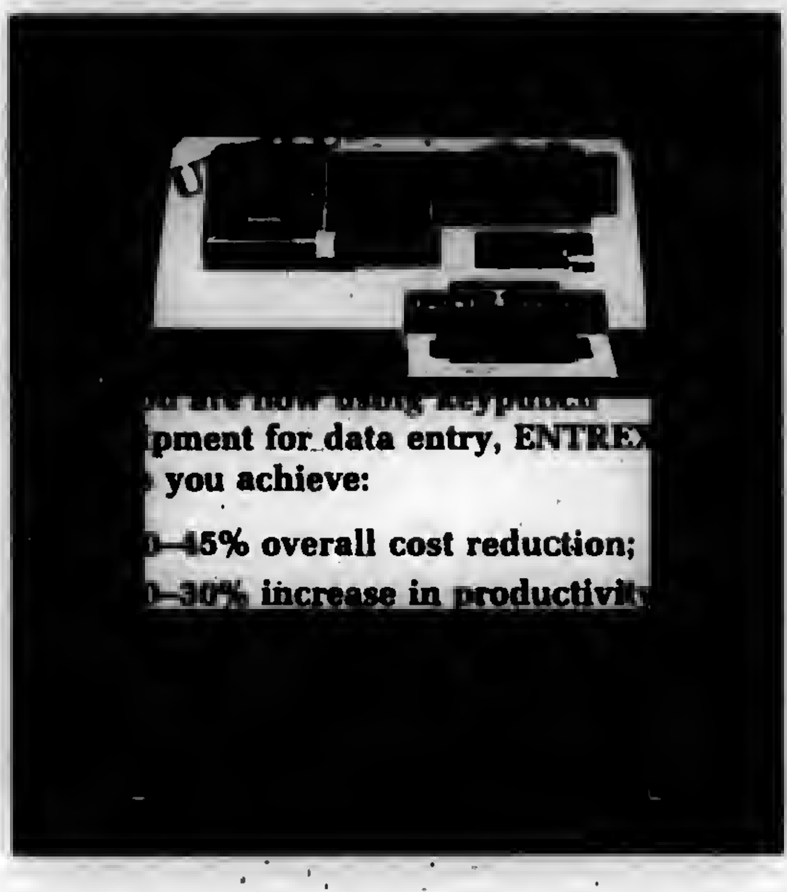
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Moss Charges LEAA Grant Requests Illegally Reviewed

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Grant applications for state and local criminal justice information systems submitted to the Law Enforcement Assistance Administration (LEAA) are routinely reviewed by Justice Department officials – including the Federal Bureau of Investigation (FBI) – in violation of federal law.

This was made public by Rep. John E. Moss (D-Calif.), chairman of the Oversight and Investigation Subcommittee of the House Interstate and Foreign Commerce Committee.

Moss believes this review amounts to "de facto veto power" and raises questions of "privacy invasion, intrusion into state and local jurisdictional bounds," and implications of "a nationwide police force." The practice should be stopped, he said.

The review violates the Omnibus Crime Control and Safe Streets Act, which states "functions, powers and duties assigned to LEAA shall not be transferred elsewhere in the Department of Justice unless specifically authorized by the Congress," Moss told U.S. Attorney General Edward H. Levi in a letter dated June 17.

It also violates a section of the U.S. Code which forbids any federal department, agency, officer or employee to direct, supervise or control any state police force, law enforcement agency or criminal justice agency, according to Moss.

Moss emphasized his point by citing a three-judge panel's opinion in Hiram B. Ely et al vs. Richard W. Velde handed down November 8, 1971.

In that opinion, Senior Circuit Judge Simon E. Sobeloff noted Congress' wish to guard against federalization of local police and law enforcement agencies.

Quoting from remarks made during the debate over legislation enacting LEAA, Sobeloff said Congress believed federalizing local law enforcement agencies "would be less efficient than allowing local law enforcement officials to coordinate their states' overall efforts to meet unique local problems and conditions."

But "even more important than Congress' search for efficiency and expertise was its fear that overbroad federal control of state law enforcement could result in the creation of an Orwellian 'Federal Police Force,' " Sobeloff added.

The judge said further that the legislative history of the Omnibus Crime Control and Safe Streets Act reflects the congressional intent to shield the routine operations of local police forces from ongoing control by the Justice Department – a control which conceivably could turn the local police forces into an arm of the Federal government.

This law, which forbids federal control over local police and law enforcement agencies, was the congressional solution for these problems.

Moss told Levi federal DP and telecommunications policy and its implementation in all areas, including criminal justice, is by law the responsibility of Congress.

He said further he could understand delegating that responsibility to the Office of Management and Budget or to the Office of Telecommunications Policy. However, delegating that responsibility elsewhere within the Justice Department "leaves the concerned American with the crucial question of why the FBI and other related agencies are involved in this vital process.

"The inescapable conclusion is that these entities are deliberately involved to shape to their own image all criminal justice operations, down to the state and local level," Moss said.

WASHINGTON, D.C. – State and local grant requests which various Justice Department committees reviewed prior to funding by the Law Enforcement Assistance Administration (LEAA) in apparent violation of federal law include a number of key DP and telecommunications systems, LEAA Administrator Richard W. Velde told Rep. John E. Moss (D-Calif.) in a recent letter.

These grants included:

- Upgrade of National Law Enforcement Telecommunications System (Nlets) Phase II.
- Upgrade of Nlets Phase III.
- Implementation of Interstate Organized Crime Index.
- Demonstration project, state-level computer-assisted latent fingerprint identification system.
- Low-cost, high-resolution facsimile transceiver.

In addition, all discretionary grant applications for operation of organized crime and corruption control project were reviewed by Justice's Criminal Division's Organized Crime Records Section, the Federal Bureau of Investigation and the Drug Enforcement Administration.

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Ohio Joins CCH

WASHINGTON, D.C. – Ohio has become the ninth state to begin entering and updating computerized criminal records in the National Crime Information Center's Computerized Criminal History (NCIC/CCH) system.

Other states fully participating in the Federal Bureau of Investigation's NCIC/CCH are Arizona, California, Florida, Illinois, Michigan, Nebraska, North Carolina and Virginia. The District of Columbia is also a participant.

Cartoons Reflect Public's Feelings About DP

By E. Drake Lundell Jr.

Of the CW Staff

NEW YORK – The study of humor is often a good way to gauge people's real feelings about a subject, so a sociologist from the University of Minnesota rolled out a sample of his 500 cartoons dealing with computers to show DPers how they are viewed in that popular art form.

Cartoons often depend on stereotypes for their humor, and those stereotypes do have at least elements of truth, Ronald Anderson said at a recent conference here. They certainly reflect the viewpoint of the general public toward a subject, he added.

Almost all of the humor about DP reflects the general public's frustrations dealing with computer systems and computer people, he said.

In addition, the majority of the cartoons reflects a great deal of ambivalence on the part of the general public when it comes to the area of computers; people generally have very positive feelings about computer systems, he said, but at the same time also bold some very negative opinions.

A thematic analysis of the cartoons covering the computer field and computer use over the last 25 years shows some major predominant themes, he said.

Dehumanizing Force

First, there are a large number of cartoons that depict the computer as a dehumanizing force. These take two major tacks – some show the people who work with computers as machine-like, others show the machines controlling society, Anderson explained.

A second major theme running through the cartoons is the humanization of computer systems, where the humor is dependent upon the feeling that the computer system really has human attributes, he said. These anthropomorphic cartoons depend entirely on the responding human for humor.

Another major grouping deals with technological tyranny, Anderson said, noting this is the most prolific theme running through the cartoons. These often deal with such issues as unemployment because of automation or show people chained to a computer system in one way or another, he said.

On the other hand, there is also a group of cartoons that basically illustrates the computer's dependence on people, which is somewhat the reverse of the technological tyranny grouping, he indicated.

These cartoons often show the computer system out of operation because someone forgot to plug it in, he said.

MIT Study Finds DP Could Speed Paper Routes

CAMBRIDGE, Mass. – Only through a computerized approach can all the many variables that enter into a sound routing policy be taken into account, according to an MIT research team here.

The team, which investigated computerized scheduling and routing of newspaper delivery trucks, came to the conclusion that computerized approaches to scheduling and routing of delivery trucks "should be part of the future electronic environment" of newspaper plants.

In order to conduct the study in a real-world environment, the researchers worked with staff at the *Worcester Telegram-Gazette*, an afternoon newspaper, to assess the requirements of its distribution system.

The investigators devised a model that considered limitations on the vehicle loading capacities, the maximum number of drop points that can be assigned to any route, the maximum time that should be allotted to any vehicle's route and the size of the delivery fleet.

They then applied the model to data provided by the *Telegram*. This data included listings of vehicle routes within the city limits, information concerning the approximately 500 drop points for bulk deliveries and information about the numbers and sizes of delivery vehicles.

Tentative conclusions of the modeling showed the 550 drop points within the city can be covered by a total of 13 routes rather than the current 20; a routing concept entirely different from the one in use is possible; and vehicle can be loaded to more than 50% of functional capability, averaging 67% capacity.

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Editorial

Moving Forward

Terminal Aiding in Search
For 'Legion Disease' Cause

Belle Tests Network's Ability
To Reduce Destruction by Flood

System Monitoring Whereabouts
Of Delegates at GOP Convention

All three of those were headlines on the front page of just one recent issue of *Computerworld* [Aug. 16].

And all three show clearly computers are being used for more projects in service to man than ever before – from searching for clues to mysterious diseases to alleviating flood damage to keeping better track of large bodies of people.

All are applications that are clearly designed to help people and as such deserve a great deal of recognition.

Too often the only stories one hears about computers are the "horror" stories where a person is dunned for a nonexistent bill or someone's privacy is invaded or otherwise threatened by data – often erroneous – that is contained in a massive data base.

This is particularly true in the general consumer press, where often the only stories about computer systems are about systems that fail or work poorly.

Of course the press is not at fault entirely; rather, it mirrors people's conceptions and perceptions about computer systems.

Most people feel somehow threatened by computers – they still believe in the stories of the "all-powerful brain" that were used to describe computers in their infancy.

Because of this threat, they like stories about the systems failing or about systems that have to be saved from massive errors by last-minute human intervention.

So the horror and scare stories predominate – stories about computers in successful applications or in service to mankind go uncovered or are downplayed. But there are as many good stories about how computers actually help man as there are stories about computers as a threat – if not many more.

Everyone in the computer community has a responsibility to try to get the general press and the general public to see this side of computer systems. Users and vendors alike should make their local papers aware of these developments.

The vendors, which generally have large public relations budgets, obviously should bear the largest part of the burden. Instead of just inundating the press about the activities of their specific companies, they should take it upon themselves to help promote the good or socially useful side of computers to the public.

But users can also play a role – either as individuals or through their organizations.

Obviously organizations can inform the press and public about specific programs they are undertaking that will improve service to the general public or aid consumers in any way.

The individual, however, should be alert to distorted and misleading stories in the news and bring such stories to the attention of the editor of that publication. Done in a constructive way, this may pique an editor's interest about the field and lead to better and more accurate coverage in the future.

It is important to change people's perceptions about computer systems because in the future many of our systems will have a greater effect on consumers and the general public than they do today. If there is a great deal of resistance on the part of the consumer, it will be more difficult to implement those systems.

And, besides, there are a lot of good stories that need to be told.

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Letters to the Editor

Creative Programming Must Aim At Easily Maintainable Programs

Regarding Anita Benson's letter on "A Plea for Creative Programming" [CW, Aug. 16]: Creativity is a people trait; structure is a machine trait. Blending these two disparate qualities is the challenge of creative computing.

The creative aspect of computer science is not obsolete, but don't confuse creativity with unorganized (dare I say unstructured?) randomness. If you think creativity is in contradiction with the Kiss [Keep It Simple, Stupid] rule, then that creativity is obsolete.

If you think creativity means even the simplest program takes two weeks to read, three more to understand and another four to modify, then that creativity is obsolete also.

If you think creativity is naming a data structure after Snow White's seven dwarfs, that creativity always has been obsolete.

Standards are not restrictions; they are building blocks to be rearranged and used creatively. If Benson feels threatened by "standards and restrictions creeping up," I suggest she redo her M.A. in math – but this time without the standards like Peano's axiom, the mean value theorem and Euclidean geometry and without the structure of inductive logic.

Furniture may "last for a lifetime and be a joy to use," but software will probably change every year and it had better be a joy to rewrite.

James M. Brown

Justice, Ill.

Basic Seen as Artist's Language

In reply to Anita Benson's plea for creative programming, I feel it's interesting programs for interesting problems that has crippled the professional stature she so wishes to attain.

Structured programming was designed to provide easier maintenance, modularity and adaptability to critical path method (CPM) and program evaluation and review technique (Pert) analysis.

The idea that a program is so well structured it will last a lifetime is applicable only in the creation of games. Business' and industry's use of computers is always changing.

I agree computer programming is still an art, but I feel Basic is the language for the artist. Hobbyists are growing in large numbers to create a "masterpiece" in Basic on their Imsai or Altair microcomputers.

Dave Myster

Chico, Calif.

The Problem of Modification

Anita Benson's letter hit on a more serious issue: What is the relationship of creativity to programming? I would suggest that any creativity must fall within the general framework of the task of producing correct and modifiable systems.

Standards and restrictions, which Benson found "creeping up" on her, can be misused but should be – and usually are – aimed at ensuring the modifiability and maintainability of the code. There is much room for creativity within this framework and within these standards: creative design of program structure, creative algorithms, creative date structures and creative testing procedures.

There is, however, a possible problem with the kind of hand-crafted masterpiece which Benson would like every program to emulate – nobody but the original master can repair or improve it. It would be creative to build and a joy to use – an efficient working system which even the most junior programmer can maintain.

Dennis P. Geller

Burlington, Vt.

Data Past

Five Years Ago
September 1, 1971

TEANECK, N.J. – Benchmarks run on an IBM 360/65 indicated the Synchsort disk sort package introduced by Whitlow Computer Systems, Inc. took about half the time of IBM's OS-based SM1 or SM-023 sort/merge packages.

– – –

WASHINGTON, D.C. – The Federal Bureau of Investigation announced its plans for opening a computerized National Criminal History System the following November, despite continuing controversy and the temporary refusal of at least one state to participate in the program.

Eight Years Ago
August 28, 1968

WASHINGTON, D.C. – A full House Committee on Government Operations approved a report which placed the computer community in indirect charge of a National Data Bank with a requirement to guarantee "the high-speed information handling does not contain a toxic which will kill [individual] privacy." The committee report stated its views and recommendations were also applicable to the structure of any data system which permits unified or central review of diverse information on individuals.

– – –

MINNEAPOLIS – Control Data Corp. agreed to merge with Commercial Credit Co., a large independent finance company. The merger was seen as making partners of CDC and RCA – competitors in the computer manufacturing field – because of a previous move by RCA and Commercial Credit to operate cooperative computer centers in the U.S.

Another Establishment

I rail with perhaps boring frequency about various Establishments in and around our trade: the ACM old-timers, the grungy top management of the main IEEE, the credit and personal information cabal, the Big Science advocates. Let me call your attention again to a *real* Establishment, in a country notorious for such things, and to an action so blatant as to have aroused even the long-suffering indigines. The story has already been carried in these pages [*per* Joe Hanlon, CW, Aug. 9], but I have a yarn to spin.

The Establishment concerned is that underlayment of lesser appointees and permanent civil servants known as "Whitehall," the inaction arm of the British government. On top are public figures: the Harold Wilsons and Tony Benns. But right below, doing most of the detailed damage, are people who correspond to our Assistant Secretaries and Deputy Thingamabobs and supergrades. Stuffier than ours, if such a thing is conceivable, and equally amazed at public rebellion.

Some years ago – yes, years – the UK government appointed a pretty good committee, chaired by the late Sir Kenneth Younger, to report on the problems of computers and privacy. After a delay so long as to produce suspicious complaints from the trade press, the professional society (the British, lucky for once, only have one!), and even the data processing user community, the Government produced last December a White Paper on the matter. White Papers are the far, far more readable equivalent of publication in the Federal Register: an announcement of proposed actions which will affect a sector of the economy, or consumers, or whatever. This particular one announced that the Home Office would set up a Data Protection Authority, to enforce many of the principles enunciated in the Younger report.

Now, the Home Office is not exactly the best possible outfit to foster such activity. Unlike our Department of Interior, it runs Scotland Yard, a constabulary much better thought of outside England than our FBI now is, but still not *quite* as pure as the driven snow. Cops are natural enemies of privacy, everywhere.

Well, the Home Secretary has just announced the makeup of the Data Protection Committee – mostly ignorant, mostly subservient, plus a few wrong-side boys whose money or plans are threatened. Not one computer professional in the lot; the British Computer Society, which had offered assistance, is outraged. Ah, but there is one industry chap – and thereby hangs a tale.

I was the featured speaker four years ago, while still at the Bureau of Standards, at a meeting in Dublin. This was about the time privacy was heating up, and I was asked to discuss it. The Grim Gray Giant, hearing of this as it hears of everything, first decided to ship Bob Courtney over from Armonk as an antidote, or at least a palliative. Economy prevailed however; I was a shelf item at NBS at the time, not a First Class Threat. So a local was dispatched – but what a local! His name was John Hargreaves, and he was a top PR man in IBM UK. He was just perfect: really believed what he had to say, which was that IBM was deeply concerned, was working vigorously in both the technical and the social sides of the security/privacy field; would be a good corporate citizen.

And he was beautiful: had been in Military Intelligence (MI) during the war, then the Foreign Office; wore bespoke shoes, probably John Lobb, a magnificent Savile Row suit – and he quoted Wordsworth, at length, from memory. Boy, did I feel grubby! Actually, he was so super he put the Irish off, and I got to do the better TV spot later.

Hargreaves is now Director of Public Affairs for IBM in London, and *he* is the industry guy on the Data Protection crew. What a company! Poor ICL; poor Honeywell; poor National Computer Centre! But reach back a paragraph or so – remember? Used to be in MI before he came to IBM? Flourish of trumpets, ending in a very small sour note! Yes, it's been noticed: the DPC is set up by the Home Office; IBM, Knower of All, sends its man; he used to be a cloak-and-dagger boy (James Lock cloak, Dunhill dagger, no doubt!). Lots of excitement . . . .

Among the great pleasures of my somewhat checkered career are those little vignettes. Readers send in letters complaining about how much personal stuff I put in the column: "Life and Times," Chapter 61. But look at what you get, once in a while: the picture of Johnny Hargreaves, dressed to kill, quoting from *Intimations of Immortality*:

> But trailing clouds of glory do we come
> From IBM, who is our home:
> Heaven lies about us in our infancy!

No doubt if Joe Hanlon had his way, the next lines would also apply –

> Shades of the prison-house begin to close
> Upon the growing boy.

Not me; I thought he was great. But they better watch him, Wordsworth or not!

Herb Grosch

Instructions for Three-Digit Edits Must Be Detailed

The Taylor Report

By

Alan Taylor, CDP

One of the standard problems in data processing is unexpected input that gets into a program and causes occasional havoc. Not everything goes wrong with all input, but everything about one specific piece of input appears to go wrong.

What has probably happened is that the edit process was not performed properly. So we should blame the programmer, shouldn't we?

More likely we should blame the person who gave out the specifications for the job to be performed.

Here is a little test for you and for your compiler. Imagine a route code, defined as a three-digit numeric. How many of the following eight examples should pass?

Route Code	Should Pass	Would Pass Compiler If Numeric
123		
000		
1bb		
bb1		
123 With t2-Zone Overpunch		
+t2		
-34		
12t With 11-Zone Overpunch		

By the time you have filled in this table, you will have found just how inadequate that original three-digit numeric route-code definition really was.

This test was devised by R.D. Gates, a project manager for McDonnell Douglas Automation Co. in Long Beach, Calif. Gates, however, went further than simply showing the problems. He proceeded to analyze both the problem and the size of the task involved in doing it properly.

Looking at the problem, the first step that can be tackled is a proper handling of the sign situation. If the specification is clarified, the last four entires which have explicit or overpunch signs would fall. This is a simple case.

More complex is the case where some sign is permitted. Here the detail of how it is to be represented must be given. And the whole question of whether the sign is to be required or optional must also be fully specified.

Analyst Specs Too

The problem of blanks adds further complexity. Today there is a trend to allow leading blanks, as in bbI, to pass the edit, but to change their form into 001. Simple enough in itself, but again something over and above the actual inspection task. It has to be kept in mind in the definition, not by the specifier but by the analyst. These are analyst specs, not user ones. They still need documenting.

Allowing leading blanks, however, does not normally permit trailing blanks which under this philosophy are rejected.

If, as sometimes happens, trailing blanks are permitted, defining whether bbI is to be accepted as 100 or as 001 is required. It can make a difference.

Zero Value Problems

Blank editing can be connected with zero-editing situations also. If blanks are acceptable and if zero-value entries are used, what is the difference between a blank field and a zero-filled one? Does the situation change in the case of leading and/or trailing blanks? More questions waiting for more answers.

Possible Edit Conditions	Data To Be Edited 123	12C*	+12	-34	12J*
Any Sign Permitted	Y	Y	Y	Y	Y
Overpunched Signs Permitted	Y	Y	N	N	Y
Leading Signs Permitted	Y	N	Y	Y	N
Negative-Only Signs Permitted	Y	N	N	Y	Y
Positive-Only Signs Permitted	Y	Y	Y	N	N
Overpunched Negative Signs Permitted	Y	N	N	N	Y
Leading Negative Signs Permitted	Y	N	N	Y	N
Overpunched Positive Signs Permitted	Y	Y	N	N	N
Leading Positive Signs Permitted	Y	N	Y	N	N
No Signs Permitted	Y	N	N	N	N
Sign Required	N	Y	Y	Y	Y
Overpunched Sign Required	N	Y	N	N	Y
Leading Sign Required	N	N	Y	Y	N
Negative Sign Required	N	N	N	Y	Y
Positive Sign Required	N	Y	Y	N	N
Overpunch Negative Required	N	N	N	N	Y
Leading Negative Required	N	N	N	Y	N
Overpunch Positive Required	N	Y	N	N	N
Leading Positive Required	N	N	Y	N	N

* Indicates overpunched character.
Y = Acceptable Data
N = Rejected Data

The above table shows the 95 different answers needed to define the edit handling of signs for different data fields.

To attack the problem, Gates used a chart as a handy one-page definition that quickly brings everyone to a common understanding. A reduced version of the chart is shown in the accompanying box together with the 19 items of definition he found are involved in even a simple edit.

The chart shows the same possible data entry fields used in the test given earlier and defines whether they would be accepted or rejected. The table can be expanded to treat the zero and blank problems if desired. These, however, are generally capable of being treated with a quick written defintion.

The situation is complicated by the "if numeric" test, which will accept some and reject others. Where such tests are to be used, it is particularly necessary to identify handling for the entire possible spectrum and to provide test data to ensure the program picks up the right answers. Installation standards are useful here.

Under most circumstances, about four or five standard usages will handle most cases and permit the complexity of editing to be reduced again to its apparent simplicity. Ideally, there could be some national standard of this, but realistically this isn't critical enough to attact that level of attention.

So, installation standards seem to be an answer worth considering. Closing our eyes to the problem and then blaming the specifier for not saying in detail what he meant is no answer at all.

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DPers Must Make Themselves Professionals

. . . And in This Corner

By Kenniston W. Lord Jr.

Special to Computerworld

There haa been perhaps no single issue more clouded in our industry's 25 year history than the basic question of whether those persons who practice DP do, in fact, constitute a profession.

On the one hand, there have been those moralists who have gone to great length to equate the term to something closely analogous to the Golden Rule or the Ten Commandments.

On the other, there are those who equally convincingly state that professionalism is as professionalism doea and that such attributes are as much a function of knowledge and experience as they are of the loosely defined virtues of honesty and morality.

An entirely differing authority would have us believe "professionalism" is a function of whether the U.S. Department of Labor classifies us as salary exempt or nonexempt or whether the employer has determined If a given salary range or job classification contributes to organizational profit in more than an ordinary manncr.

Added to that is a recent court decision which has decided that a certain classification of our people are *not* professional and are therefore entitled to compensation for services beyond the normal duty period [CW, Feb. 9]. It is entirely possible that firms may be facing such backward compensation in a grand scale, for some DP practitioners will relate tales which could put descriptions of slave labor to shame.

Perhapa when DP practitioners awaken to the fact that they could exert such pressures were they to organize as a class, that will come about. At that time, the firma in question will begin, in a big way, to promote the traditional attributes of professionalism – mandatory people standards, mandatory and uniform educational standards, peer evaluation mechaniams, legal sanctions for the people and legal control over the products which the people produce.

Such moves are, in many ways, desirable right now, for they carry with them the concommitant requirements of accountability and responsibility. But more importantly, those requirements, when established by the DP community itself, will perhaps be the first step toward making the practice of DP what many of us feel it should be – a profession.

The interesting thing, however, is that we may not be able to wait until the industry itself begins to move. Such accountability and responsibility may be imposed upon us by our demonstrated irresponsibility toward the impact of the systems we develop upon the public at large. Sooner or later, just one too many of that public is going to be disadvantaged, incapacitated or killed, and the groundswell will begin. A sophisticated populace will demand recourse from an increasingly sophisticated Congress and then, all of sudden, accountability and responsibility will become a mandate of law rather than a mandate of choice.

Indeed, accountability and responsibility begins with those who are willing to accept it, and a wholesale program of such acceptance with demonstrable evidence of it, presented in a convincing way to the public, would at once be useful.

Such an approach is, indeed, desirable – but not very realistic. The minority of us who are not touched by apathy see the only commitment to our "profession" by many DPers is a single hour – meal and entertainment – spent at the local chapter of the Data Processing Chowder and Marching Society.

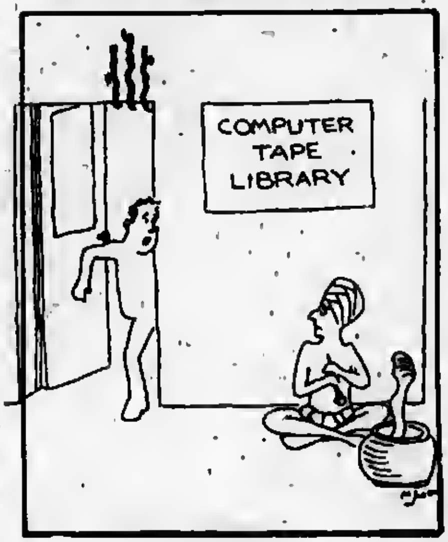
Unfortunately, auch benign neglect is far from aatisfactory. What is needed is an organized activity to produce such a atructure and to produce it quickly and effectively, for the alternative is crystal clear: either we do it – you and I – or we wait until the game of brinksmanship has been played to its climax, laying disadvantage, harm and death in its wake.

Tradltionally one would expect that it would be the function of the various societies to perform such duties. But It is simply not in their interests, individually or collectively, to rock the boat.

The movement, if it is to be made by ua and not by legislators, must begin with you and me and must be a threefold process: (1) open acceptance, at the personal level, of such responsibility and eccountability; (2) open, frank and directive discussion in the pagea of the media and monthly social gatherings; (3) the application of pressure on the professional organizations and legialators to indicate the problem is indeed real and requires resolution.

You want this to be a profeasion? It must begin with you. You've got to prepare for it, accept it, demand it. Yes, you may outlive the problem.

And then again, you may not.



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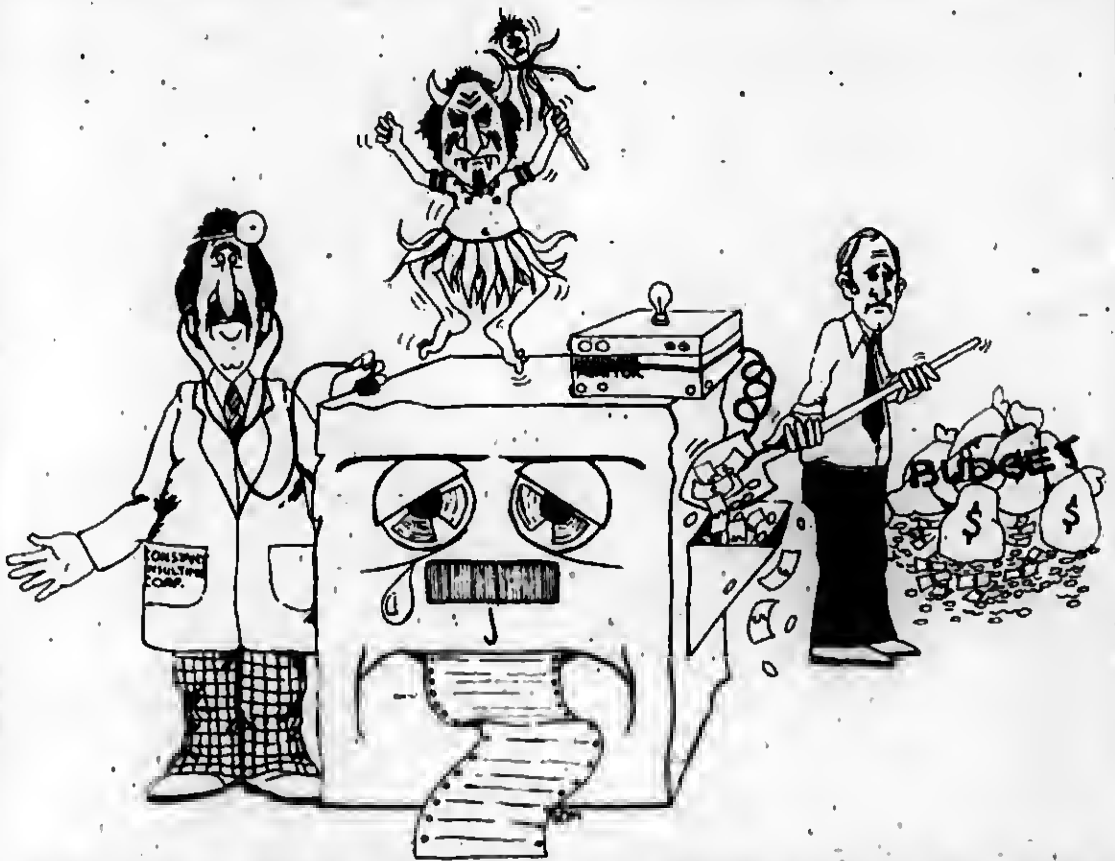

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U.S.-European Ties Still in Place

Ansi OKs, Ecma Defers Acceptance of PL/I Standard

By Don Leavitt
Of the CW Staff

NEW YORK – PL/I has officially become a standardized language – but only in this country.

The American National Standards Institute (Ansi) completed the last of its approval cycles of the proposed standard earlier this month.

Designated X3.53-1976, the standard should be ready for distribution this autumn, but it is too early to know how large the book will be or how much it will cost, according to an Ansi spokeswomen.

The dream of having PL/I the first programming language to be formally standardized in the U.S. and Europe concurrently failed to become reality, however. At a meeting last month in Geneva, the European Computer Manufacturers Association (Ecma) officially delayed its acceptance of the proposed standard until at least December.

Setback Not Serious

Ecma's "deferment of acceptance" is not a serious setback for the ultimate approval of the standard by the Europeans, according to John Kuoni, vice-chairman of the Ansi X3J1 committee that worked up the draft standard for the U.S. DP community.

Liaison work between X3J1 and the Ecma technical committee is continuing, he said, emphasizing his group wants to do anything it can to help gain acceptance of the standard by Ecma.

The draft proposed standard was first made available for public comment in April 1975. At that time, X3J1 chairwoman Lois Frampton acknowledged the proposed text was quite different in format from earlier standards for, as an example, Cobol.

The Cobol standard generally defined the elements of that language, including options, and illustrated what they meant from the user's standpoint. The PL/I proposal, now the standard, describes what an implementor has to do to make the elements of the language do what the user expects.

Ecma's delay in approving the standard seems almost an echo of the Ansi situation, although the European "deferment" is more formal than the American delay.

Nonetheless, Ansi's X3 secretary Robert Brown estimated a year ago [CW, Aug. 20, 1975] that Ansi's work should be complete before the end of that year.

Root of Hesitation

The European technical press does not seem to take the Ecma delay as a serious problem. The UK's *Computer Weekly*, for example, noted recently that practical problems of implementation and some concern over what governments might do if they were "equipped with an Ecma-endorsed standard" seemed to be at the root of Ecma's hesitation.

While a number of American manufacturers have implemented PL/I successfully, the paper noted that International Computers Ltd. in particular "has long considered a PL/I implementation but rejected it on technical grounds."

With a standard available to them, governments "would be tempted to make PL/I compulsory" for government projects, according to another view of the problem. This would be a "considerable embarrassment" to any manufacturers with machines on which PL/I is difficult to implement, *Computer Weekly* said.

Since the U.S. government has already committed itself to use of Cobol as a Federal Information Processing Standard, that concern was not a factor in Ansi's considerations.

Started at IBM

PL/I was first publicly discussed in 1964 when IBM introduced its concepts – the idea of a systems language and not just a programming tool – under the name "New Programming Language." Its abbreviated form, NPL, conflicted with another language already on the scene, so IBM changed the name to Programming Language/I.

Almost exclusively an IBM 360-oriented language during its early development, PL/I has been implemented in various ways by a number of groups working with numerous mainframes and minis in the past half-dozen years.

Standardization efforts started under Ansi's predecessor, the United States of America Standards Institute, in the late 1960s. That apparently was too early; a more informal group of users and implementors met and swapped ideas over the next few years just to clear up details, including agreement that the designation should be PL/I (with a Roman I and not a numeric 1).

The groundwork done by that group led directly into the formalized Ansi-Ecma standardization effort, release of the proposed standard in 1975 and approval in 1976.

'DMS/OS' Developed to Control Data Sets, Use of DASD Space

SACRAMENTO, Calif. – The proliferation of data sets being placed on direct access storage devices (DASD) and the increasing capacity of the devices themselves led to development of DASD Management System (DMS/OS), according to its vendor, Software Module Marketing (SMM).

Compatible with IBM's OS and OS/VS environments, DMS/OS provides data set retention control, selective dump/restore facilities and archiving of user-designated files, SMM said.

A volume configurator to optimize DASD space and a number of management-level and technical reports are also part of the package, a spokesman noted.

Separately priced modules support user billing for DASD space and interfacing with a teleprocessing environment, he added.

Automatic scratching of data sets is accomplished through the retention control component, which is governed by the expiration date field in the data set control block, scratch exclusion tables, scratch candidate file contents or the catalog status, he said.

Selective dump/restore and archiving have a number of similarities, the spokesman acknowledged, but noted their basic purposes – protection of regularly used files in the first case, storage of seldom used files on less expensive media in the second – require separate modules to handle these tasks effectively.

The volume configurator facility handles the distribution of data sets and free space across a disk pack, eliminating much of the clerical effort usually associated with the layout and planning of DASD space use, SMM said.

It can be used with new volumes containing only the Volume Table of Contents (Vtoc) or with existing volumes, which may need reorganization to achieve desired goals; a set of utilities are included to help resolve any such conflicts, the spokesman added.

The package is driven by tables wherever function controls can be parameterized. Fields in DSCBs as well as internal data elements are defined in tables, the vendor said. Report formats are managed through tables as well, the spokesman added.

The basic DMS/OS costs $8,900 while the user billing modules are an extra $1,200. The teleprocessing interface module – including IMS/TP – costs $1,500, SMM said from the Crocker Bank Bldg. Penthouse, 1007 7th St., Sacramento, Calif. 95814.

NCSS Extends Analysis Of Electronic Circuits

NORWALK, Conn. – A newly released version of Ispice, an interactive program to simulate and analyze electronic circuits, is now available on the National CSS, Inc. (NCSS) remote-computing network.

The scope of the system is such that circuits "containing a virtually unlimited number of components" may be simulated in a single operation, NCSS said from 542 Westport Ave., Norwalk, Conn. 06851.

Package Aids Datapoint Planner

MONTEREY, Calif. – Dataflow from SCM-Plex Corp. is described as a syntax analysis system for Datapoint equipment users which scans a Databus or Datashare source program and produces flowcharts, program diagnostics and related cross-references.

Input to the system is a Databus/Datashare program in the same general form that would be presented to the DBCMP compiler, the vendor said.

Depending on the operating system used, the input may be on diskette, cartridge disk or mass storage disk packs, a spokesman added.

Called for execution like any other Databus/Datashare program, Dataflow performs statement analysis, allocates procedures to pages for printout and references the last entry point by line, page and inclusion.

In addition, it details condition codes that could be set by any "opcode" – by line, instruction, inclusion and page, according to the spokesman:

Dataflow draws all logical symbols, identifies the locations of referencing labels at the point referenced and supplies all traps set during any disk I/O, he continued.

The flowcharts are produced in the same order as the source statements are written. This preserves the integrity of the source language and makes it "quite convenient" to use the flowcharts side-by-side with a compiled listing, the spokesman added.

The output is said to conform to American National Standards Institute (ANSI) flowcharting.

Dataflow is available for $500 on a one-year license. It is also available with a spooler for $750, the vendor said from 161 San Bernabe Drive, Monterey, Calif. 93940.

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File Keys, Names Matched

WOODLAND HILLS, Calif. – The Data-Index package from Case, Wachter & Associates, Inc. was designed to bridge the gap between the name commonly used for a person, place or thing and the number under which it may be filed in any given data system.

This capability should solve the problem caused by the fact that most data files are kept in sequence by some numerical key – such as policy, account or part number – while users and customers generally think in terms of names rather than numbers, the vendor said.

Intended for either on-line or batch use on IBM 360/370 mainframes with almost any of the disk subsystems commonly available, Data-Index allows the user to enter a name and to get back the appropriate number so the file can be accessed effectively, according to a spokesman.

The software has the ability to conduct "phonetic searches" in which it produces a listing of all number keys that might relate to a name; this is particularly useful, the vendor noted, when inquiries come in by telephone and the terminal operator may not be completely sure of the name being spoken at the other end of the line.

Use of Data-Index imposes no programming changes on the installation's application programs.

Available in both DOS and OS, the system utilizes IBM 2311, 2314, 3330 or 3340 disk drives.

Main memory requirements are 3K or 4K for on-line use up to a maximum of 25K for off-line OS use.

Data-Index is available for $4,500 from the vendor at Suite 243, 21243 Ventura Blvd., Woodland Hills, Calif. 91364.

Human Resources System on Net Combines Census, EEOC Data Use

NORWALK, Conn. – A human resources system designed to meet the reporting requirements and affirmative action programs of the Equal Employment Opportunity Commission (EEOC) is now available through the remote-computing facilities of National CSS, Inc (NCSS).

The system helps companies compare their hiring practices with local census information in order to keep up with EEOC Affirmative Action requirements, NCSS said.

In addition, the system is said to offer complete on-line personnel management capabilities.

The system "is believed to be unique," an NCSS spokesman noted, explaining "it can match user data with both the 1970 federal census data and the 1975 EEOC compliance data, broken down by location, industry and job type.

That combination of census data and EEOC data was described by NCSS as available only through the facilities of the network and of the interactive data base management system, Nomad.

The on-line capabilities give users the ability to see how their hiring practices compare with the demographics of their area and with other companies in the same industry in that area; that type of documentation is important in justifying affirmative action programs and avoiding litigation, NCSS added.

The Nomad-based system is said to provide user management access to a number of "parameter" figures by which personnel practices can be judged. These include the number of people living in a geographic location broken down by race, sex, etc. and the number of people employed in that area broken down by race.

Data is also provided to identify the number of people employed in an industry within that geographic location broken down by EEOC categories, the spokesman explained.

The NCSS service is available locally in most major metropolitan areas in the U.S. The company is headquartered at 542 Westport Ave., Norwalk, Conn. 06851.

Package Plans Tabs For Remote Printing

NEW YORK – Tableau from Bi-Hex Corp. analyzes computer printer images and determines the optimal locations for horizontal tab stops for users who want to communicate, spool or print the images on remote terminals, according to the vendor.

The product may be used in various ways in IBM 360/370 environments, ranging from a stand-alone tool for tab-feasibility testing to an "on-board" subroutine for automatic tab setting as new tasks are introduced, the company added.

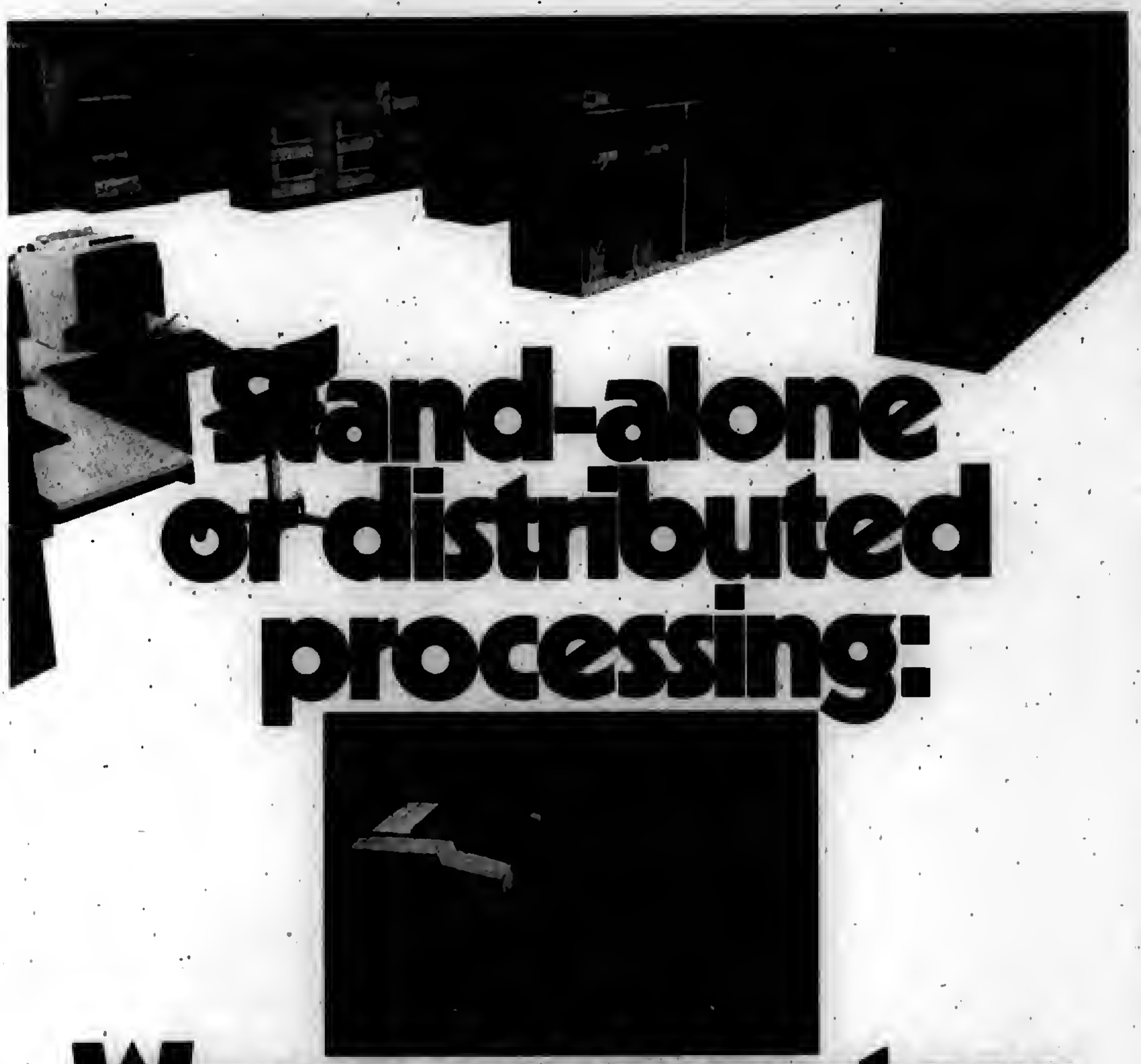
Input to Tableau is a tape or disk data set comprised of the print images of the report to be analyzed; output is a single-page bar graph "which can be easily interpreted" in terms of cost and performance, a spokesman explained.

For fixed-tab equipment, the graph can predict the effects on network performance that such changes as new report formats or volume fluctuations will cause, he claimed. For more modern terminals with "firmware" tab stops, the graph can be used to optimize the tab-stop commands, he added.

Human intuition for setting tab stops "has its limitations," he argued, especially in the cases of mixed reports or irregular report formats.

Written in ANS Cobol with a called Assembly language subroutine for line scanning, Tableau requires a minimum 6K partition in any IBM 360/370 operating environment.

Source code, documentation and 90-day support are provided for $650, the company said from Suite 303E, 200 Park Ave., New York, N.Y. 10017.



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Debugging Easier, Too

With Current Tools, Even Cobol Can Be Used in GDP

By Richard J. Cichelli
And Martha J. Cichelli
Special to Computerworld

Goal-directed programming (GDP) is a technique of problem decomposition that leads naturally to top-down, structured program design and coding [CW, Aug. 2, 16].

Concepts and Techniques

At each step in the process a goal is identified, an assertion is made that will be satisfied when the goal is met and a logical condition is derived that can be tested in the program's control code.

How does GDP affect the testing and debugging process? Debugging can be the most time-consuming part of program development. Since goal-directed programs are structured, they share all the error-reducing benefits of structured code.

Additionally, in debugging a goal-directed program, the programmer systematically looks for unmet goals, unsatisfied assertions and untested conditions. Goal-directed reasoning helps in testing and localizing errors.

Documentation for goal-directed systems is more meaningful and less tedious to produce than for the typical system in the past. It takes the form of a narrative of the design process and presents an idealized version of the solution process.

It is important to remember the only real documentation of a system is its code. Even in-line comments should be suspect (after all, they aren't executed). Everything must be done to make the code readable. System documentation should be a designer's guide to the readable code.

Applicable to Big Projects

Is GDP applicable to large system design? In a large project, communication among design team members and between the team and the user client is facilitated by the explicit factoring of the project into functionally oriented goals.

At the team level, the project can be properly analyzed in terms of goals instead of being mapped into a possibly inappropriate personnel organization.

When users receive a statement of functionally specified goals and interact with the design team to refine these goals, then incremental implementation, availability and use of the system are possible. In this way users get some of the benefits of the new system even before it is completed, and the designers get the feedback of user experience while the design process is still under way.

A goal-directed presentation of the system design can be understood even by naive users and can make a synergistic relationship between designers/programmers and end users possible.

Influence of Language

What tools make GDP easier? The programmer's language has a tremendous influence not only on his coding style, but on the way he thinks about problems.

GDP depends on the facility to group statements into functions or blocks, each of which can be treated at any arbitrary level of nesting as a single statement. It is this statement-bracketing facility that makes it possible to replace any block (e.g., a single statement) with any other block (e.g., "IF condition THEN statement1 ELSE statement2") without disturbing the surrounding code.

When this is lacking in a programming language, top-down development by "stepwise refinement" and GDP become more difficult and time-consuming.

Languages like Pascal, C and Bliss are well suited for GDP (there is probably no language that offers as much data structuring capability as Pascal).

Neither Cobol nor Fortran is a block-structured language. Fortran is particularly deficient in control structures although some changes have been made to improve that [CW, Aug. 2].

Cobol gives the appearance of having the necessary structures (it has an IF-THEN-ELSE and the PERFORM-UNTIL seems a reasonable variation of the WHILE-DO), but they are lacking in several important respects.

Cobol's implementation of the IF-THEN-ELSE (with no statement bracketing) does not permit the arbitrary substitution of an IF-THEN-ELSE block for another block. For example, if

```
IF A THEN
  STATEMENT1
  STATEMENT2.
```

becomes

```
IF A THEN
  IF B THEN
    STATEMENT1A
  ELSE
    STATEMENT1B
  STATEMENT2.
```

the execution of "STATEMENT2" has been affected when it should not have been. With a statement bracketing facility,

```
IF A THEN
  STATEMENT1.
  STATEMENT2.
ENDIF
```

becomes

```
IF A THEN
  IF B THEN
    STATEMENT1A.
  ELSE
    STATEMENT1B.
  ENDIF
  STATEMENT2.
ENDIF
```

and "STATEMENT2" has suffered no side effects from the modification to "STATEMENT1."

Cobol's PERFORM-UNTIL (where the performed code must be named and must be out-of-line as opposed to the in-line code bracketed by a WHILE-DO and ENDDO) leads to a proliferation of paragraph names and scattered pieces of code. This may interfere with readability rather than enhance it and may create system inefficiencies because of nonlocality in a virtual storage environment.

Manager's Dilemma

The programming manager then is faced with a dilemma – his programmers need a better language and yet, for reasons of compatibility or portability, for example, he may be reluctant to abandon Cobol or Fortran.

Extensions to these languages have been

(Continued on Page 18)

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Yourdon is the author of *Techniques of Program Structure and Design* and *How to Manage Structured Programming.* And co-author of *Structured Design* and *Structured Programming in COBOL.*

Weinberg is the author of *The Psychology of Computer Programming* and *An Introduction to General Systems Thinking.*

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Open Paths, Active Guidance Help Staff to Develop

By Richard Houser
Special to Computerworld

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Carefully applied career-pathing methods greatly benefit both employer and employee. Of particular importance to a DP operations section is an integrated personnel training and development program.

The Human Connection

Dual objectives of employee satisfaction and job interchangeability are served in such a program. Both objectives are key components of the healthy atmosphere necessary for company prosperity and individual growth.

With these objectives as a guide, the operations manager can increase the flexibility and productivity of his staff while minimizing turnover, a problem which often plagues the operations area.

In the first phase of this program, the program administrator (PA), usually the operations manager, breaks down the operations section at least mentally into several distinct autonomous areas. These are usually the existing section divisions – the data control, data entry, console operations, librarian and documentation functions.

A directional path through these physical areas for employee development is established, with an individual section designated as a "staging area" for entry-level employees. Data control can serve this purpose well.

In most cases, a single path can be developed for most employees, although it is sometimes necessary to tailor a path to an individual who has exhibited special strengths and aptitudes in certain areas.

Once the PPG areas and paths are defined, the PA introduces a qualified trainee into the staging position. At this point, the trainee is known as a "novice career participant" so he is not prematurely identified with any final goal.

The PA makes the trainee selection by in-depth interviewing and determining that an individual's abilities *not experience*, exceed those required by the entry-level position.

A close evaluation of the participant's learning abilities, productivity and attitudes at each stage of development should be maintained by the PA.

The participant is then moved along the preestablished path toward his goal. The PA constantly monitors this employee and modifies the program to the individual.

With each additional experience, the participant becomes increasingly versatile and gains a wider perspective and understanding of both departmental and company goals.

After the PPG program is established, the PA can insert qualified existing employees into the development stream anywhere along the way. Caution must be used to ensure each participant has the personal capabilities, not just the experience, to attain higher level goals.

As this program gains momentum, administration becomes increasingly easier since the experienced participants will have recognized the basic formula (as applied to them) and will voluntarily assist in guiding new participants over the rough spots.

The end goal of the program is to achieve at least a minimum percentage (30% to 35%) of total employee participation, with nonparticipants ideally having been through the program.

Of greatest value is each individual's understanding that he can grow and achieve active visible goals, regardless of the frequency of promotions or terminations. And, if corporate goals are transmitted to all levels, the individual goals strengthen the section goals, and in turn the departmental goals, to the top of the organizational pyramid.

Important ingredients to ensure this program's success are:

- Upper management support of this program. During the initial stages, operations supervision and management may have to live with work force adjustment to a program of this type.
- People-oriented administration. The PA must be willing to place faith and trust in his people in order for them to grow.

Houser is computer operations supervisor at Price Pfister in Pacoima, Calif.

Precompilers Make Cobol OK for GDP

(Continued from Page 17)

discussed. But an interim solution – one that can be implemented immediately – involves the use of a precompiler to translate programs written in a language more directly suited to the GDP technique into the target language (i.e., Cobol or Fortran).

The program presented in Part II [CW, Aug. 16] was written in Scobol. The language and its precompiler were developed at Volvo Flygmotor in Sweden. Scobol permits the GDP principals to be put into practice to speed the design and implementation of superior Cobol programs.

GDP is not a panacea or an instant solution to all programming problems. It is a language-independent, problem-solving technique which, when carefully applied, can lead to quality programs. It deserves our study and experimentation.

Richard Cichelli is research manager of computer applications at American Newspaper Publishers Association/Research Institute, Easton, Pa. Martha Cichelli is a partner in Software Consulting Services, Allentown, Pa.

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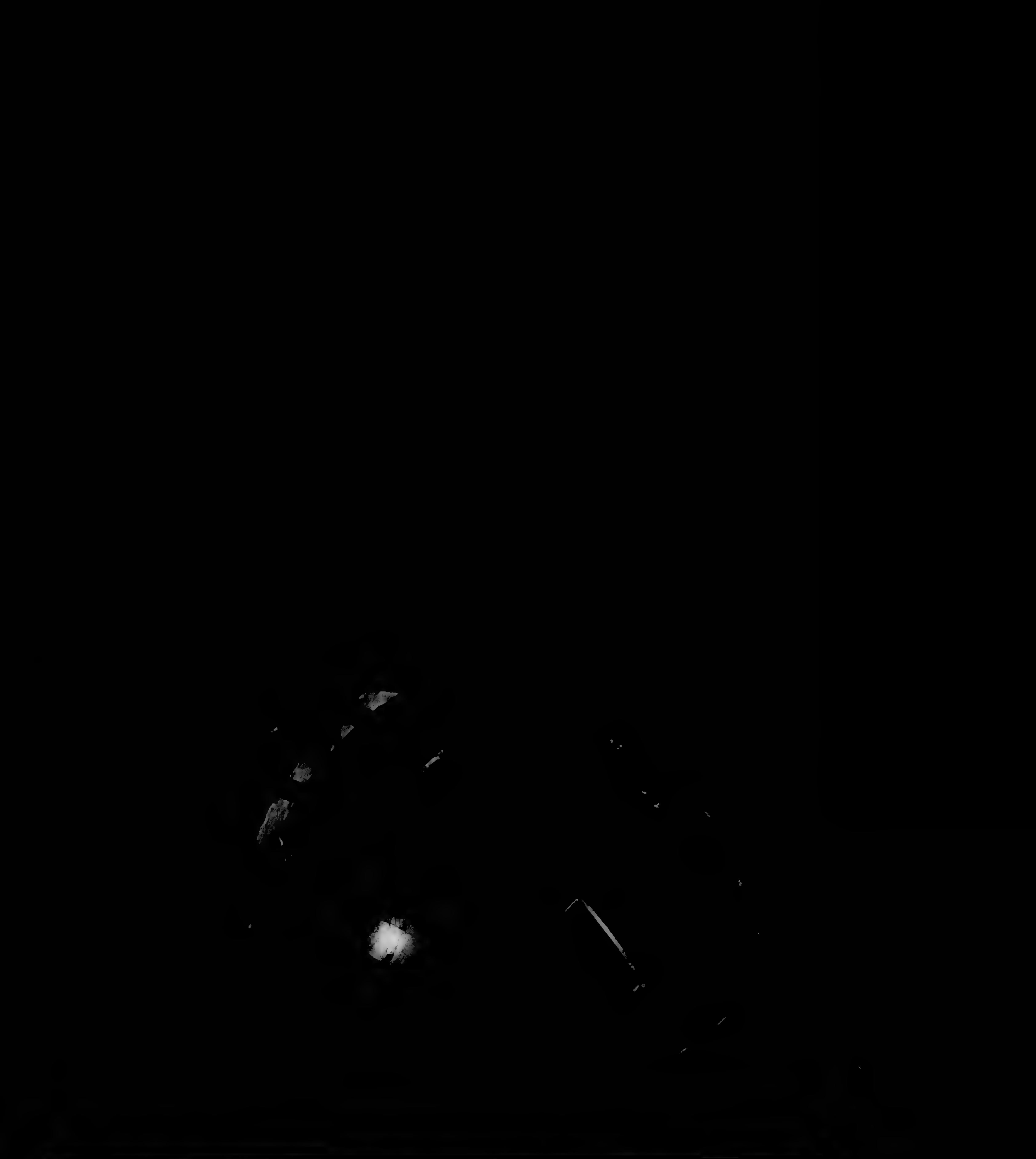

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COMMUNICATIONS

Cites Ease of Implementation

Insurer Starts From Scratch to Build Net for Future

By John P. Hebert
Of the CW Staff

CHICAGO – A large insurance corporation based here said it had a relatively easy time implementing an $8 million computerized communications network which would suit its needs far into the future – solely because it built the network from scratch.

About one and a half years ago, when CNA Insurance was acquired by Loews Corp., it was a very loosely structured company, according to Jack Avignone, senior vice-president of services.

CNA realized that it had to work through the 31 branch offices dealing with different segments of the insurance industry and that the solution to the problem of fragmentation was to support the entire operation from a central point, Avignone said.

The alternative to one full-service branch to provide for future needs, he said, was to decentralize the entire operation. This approach, however, would have been costly in terms of both time and money to support and maintain equipment located in offices across the U.S. and in Puerto Rico.

Fortunately, CNA had these alternatives open to it because it was not heavily involved in computerized operations: "We were so far behind the rest of the world that we could do a lot of leapfrogging and jump ahead" to meet the needs of both the present and of the future, Avignone said.

So many other companies with a long involvement with computerized data processing and communications are often locked-in and would like to be able to start from scratch and build the network over again, he said, explaining CNA's advantageous position.

After about a year of planning, CNA began implementing the corporate communications network it had designed in conjunction with IBM.

By last March, the bulk of the network was operational, running with a 4M-byte IBM 370/158 CPU with 30 IBM 3330 disk drives, he said.

The network consists of 205 IBM 3270-compatible Courier Terminal Systems, Inc. CRT terminals, 64 IBM 3270 CRTs, 18 IBM 3284 printers and one IBM 3740 CRT data entry station in Puerto Rico which feed data into an IBM 3705 network controller.

Mixture of Lines

A mixture of communication lines – supplied by AT&T, Data Transmission Co. (Datran), MCI Communications Corp. and ITT – carries the data to and from the branch offices and the Chicago headquarters at a standard speed of 4,800 bit/sec, with two exceptions of split-streaming to accomplish 9,600 bit/sec speeds.

Removal of three Datran circuits because of "a difficulty in getting the performance we were looking for with load service at the remote locations" resulted in bringing the number of Bell System lines to 18, Avignone stated.

The MCI Communications line, however, "has been excellent," he said, and there are no plans to change it.

During off-shifts, CNA uses the network for CPU-to-CPU transmission between its four secondary processing sites which house IBM 360/20s and Mohawk Data Sciences Corp. MDS 2300 processors.

The system, according to Avignone, has cut the response time to between 7- and 10 sec on the average for CNA's 20,000 agents and two million policyholders to receive information about a particular account.

CNA is presently handling more than 30,000 messages each day through the system. It is expected to handle about 240,000 transactions per day in three years' time with only minor modifications, Avignone commented.

The teleprocessing network is supported by another IBM CPU, a 370/168 running under IBM's IMS data base management system. The IMS implementation "was not as simple and direct to bring up" as some may think but CNA received "tremendous support from IBM" in bringing this and other network phases into working order, he said.

Avignone believes the system has the capability for CNA to provide, in the

(Continued on Page 26)

Sanders Enhances It's 3270-Compatible CRT, Introduces Emulators for Non-IBM 2260 Types

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – Sanders Data Systems has introduced a series of enhancements to its CRT terminals which are IBM 3270-compatible.

In addition, the company has developed plug-compatible capabilities to replace Honeywell, Burroughs and Univac terminals.

The 3270-type enhancements were designed to upgrade the Sanders 8180 terminal system to provide the user with features not available on the 3270, a spokesman noted. The Sanders capability lessens the dependency of the CRT on the host CPU and allows the terminal to interact with a terminal controller at the user's remote site, he added.

The field-upgradable features on the 8180 include local format storage which allows screen formats to reside in the terminal controller on a diskette or disk. This reduces communications line loading and reduces terminal transaction response time, according to the spokesman.

Another capability is queued transaction handling which allows uninterrupted data entry if the communications lines are down. The 3270 cannot function without a link to the CPU, the spokesman noted.

The local storage also allows subsets of mainframe data files to be stored at the terminal site, reducing access times, he added.

Local validation and arithmetic functions allow the 8180 to perform error-checking and editing functions at the source; a formatted local print feature allows data displayed on the CRT screen to be printed out without communications interaction with the CPU; and control functions can be added to single keys, he said.

The features are available on an individual basis depending on the user's needs. Prices range from $50/mo to $200/mo for a single feature; a disk or diskette storage capability can serve up to eight 8180 displays.

For a typical seven-display system, the queued transaction handling would cost about $1,000/mo on a three-year lease. The required diskette storage and software would cost $150/mo, a spokesman said.

First delivery of the enhancements is scheduled for the fourth quarter of this year.

Non-IBM Compatibility

Sanders has also introduced emulators which allow its CRTs to replace Honeywell 7700 and 775 VIP terminals; Burroughs TD 801 and 802 CRTs; and Univac Uniscope 100 and 200 terminals.

The plug-compatible features generally replace the original "2260-type" terminals from the mainframe vendors and emulate the original protocols using the same hardware as the Sanders 3270-type hardware, the spokesman said.

The units can be programmed with additional features or operate as mirror images of the original vendor CRTs; most capabilities do not disturb normal mainframe operations, he added.

The Sanders 8770 replaces the Honeywell 7700 and 775 VIP terminals. The 8770 adds clustering of up to 32 CRTs, synchronous transmission up to 4,800 bit/sec, faster print speeds and other features not available with the Honeywell terminals, Sanders said.

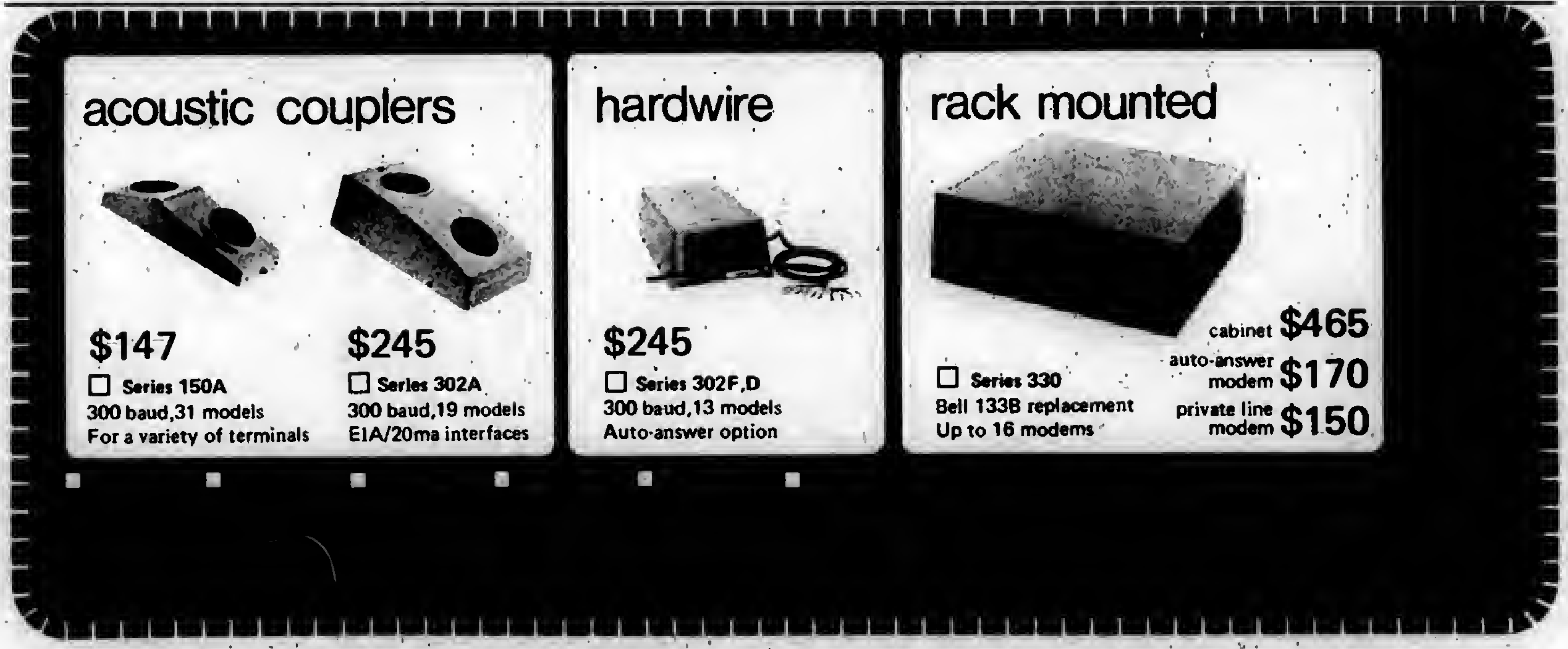
The Sanders replacement is typically priced "about 25% to 40% below" the Honeywell terminals with the additional capabilities, according to the spokesman.

The Sanders 8220 series replaces the Burroughs TD 801 and 802. It adds buffered printing, parallel clustering and faster print speeds at prices about 10% below the original systems, the spokesman said.

The Sanders 8210 U/Scope terminal emulates the Uniscope 100 and 200 terminals and adds transmission capability up to 9,600 bit/sec, buffered printing and diagnostics at a cost "about 20% to 30% below" Univac prices, he said.

The non-IBM emulators are available on a 90-day delivery with a typical 16-tube system priced at about $2,000/mo on a three-year lease with maintenance.

One- and four-year leases are also available, Sanders said from Daniel Webster Highway, Nashua, N.H. 03060.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BSR Option Extends LA36 Capabilities

MARLBORO, Mass. – Digital Equipment Corp. has introduced a microprocessor-based feature for the LA36 Decwriter II terminal with both editing and store-and-forward capabilities.

Called BSR, the feature allows a user to prepare, edit, update and store messages for batch transmission at rates up to 300 bit/sec. The store-and-forward capability minimizes communication line charges in both DP and communication applications, the firm said.

BSR lets an operator edit messages off-line with flexibility that reportedly was not previously available using asynchronous send/receive terminals. A solid-state unit, the BSR feature has editing functions faster than those offered by current magnetic- and paper-tape techniques, the firm said.

Data within the text can be located within milliseconds, allowing a user to edit a line or multiple lines of text.

The BSR feature is on a single printed circuit board containing the power supply, control unit, read-only memory for instructions and random-access memory (RAM) for data storage. The capacity of the RAM for message storage is 16K characters maximum, the equivalent of 120 feet of punched paper tape, DEC said.

With BSR, the operator can use the LA36 terminal either in the keyboard send/receive mode or off-line preparing messages in the BSR mode.

The feature ranges in cost from $495 with 4K characters of RAM to $998 for 16K. Memory for the BSR option is available in 4K character increments.

Deliveries are scheduled to begin in October; units will be available on a 30-day order basis.

Precluded Necessary Expansion

Phone Costs Drive School to Mini for Net

By J. Donald Mild

Special to Computerworld

ARCATA, Calif. – When an analysis revealed the five-year cost of telephone equipment would equal or exceed the cost of a newly installed minicomputer, a university here began to seek another way to support distributed time-sharing terminals.

Humboldt State University, located in the northwest corner of California, has about 40% of its 7,500 student enrollment in the schools of science and natural resources, both heavy computer users. In addition, it offers a degree in business information systems.

Prior to last December, when a Digital Equipment Corp. PDP-11/45 was installed, conversational computing capacity was limited to four 110 bit/sec channels to the California State University and Colleges' (SCUC) central time-sharing computer in Los Angeles.

That facility is accessed by the SCUC'a 19 campuses through a multiplexed private-line network which is also used for remote job entry (RJE) batch processing on a separate computer system. The central systems are dual Control Data Corp. 3170 and 3300 configurations; Humboldt State uses a CDC 3150 for in-house batch processing and the RJE "terminal."

The 16-port mini, acquired through a single 19-campus competitive procurement, offered the potential of satisfying many of the needs for interactive computing which the limited access to the central system had denied. The mini, in combination with central access channels, allows up to five times as many active users to solve problems or learn to program Basic as before.

Professors had been forced to cut back on their computer-related applications because of the saturated central system. They are now moving ahead again – some by converting to the mini, others by taking advantage of the reduced load on the central facility.

The PDP-11/45, with RSTS-E software and a large user library, provides 88M bytes of disk, magnetic tape I/O, a line printer and 16 programmable speed multiplexer ports. Plans called for the installation of terminals in small clusters in buildings where classes needing them are held.

Laboratories requiring intermittent terminal use will be accommodated with mobile units designated to service multiple locations according to a schedule. A variety of terminals were available, including ASR-33 teletypewriters, CRTs and auxiliary cassette tape and X-Y plotting devices.

Criteria Determined

Criteria were developed in the summer of 1975 to serve as the basis for a communication plan which would link the terminals with both the mini and the statewide network.

The key elements were that each terminal should be able to contend for access to the central time-sharing computer as well as the mini, depending upon the requirement of the problem to be solved and the number of communication lines needed would be based upon the locations to be served, rather than the number of terminals available for access.

Additionally, in order to assure full student access and optimum computer utilization (on both systems) when terminals might be out of service or when the buildings housing them were closed, at least 30 machines would be needed for access to the 20 computer ports.

Dial access communication using the university Centrex woold readily allow for terminal contention and for switching between computer systems. However, dial access costs for lines, modems, etc. for a five-year period would total about $70,000 and be subject to rate increases, while the mini was priced at under $67,000.

University staff agreed such an expense was not warranted, noting the future expansion of additional terminals and computer memory and ports could be precluded by high communication costs.

A port selector, the Infotron Corp. TL 450, was found to satisfy the contention and awitching requirements with hard-wired terminals. A five-year cost of about $27,000 was projected, using leased unloaded Pacific Telephone Co. (PT&T) metallic-pair circuits (without modems) including line installation and port selector costs.

The first PT&T reaction was in the form of a caution that reliability could be a problem when transmitting data on cables over 50 feet in length.

When university tests (on three-wire EIA lines) showed high reliability at distances of over one-half mile, PT&T issued a statement prohibiting transmission of unmodulated signals greater than 75 bit/sec through its cable plant.

The cost of an independent cable installation was then investigated, and it was found $7,000 would cover the purchase and installation of sufficient cable to connect 100 terminals distributed through seven principal buildings to the port selector.

For an investment of under $25,000, the university was able to provide for its current needs, and it will be able to accommodate increased ports and terminals through the incremental expansion of the port selector at a maximum cost of $175 per unit.

Lastly, a number of side benefits are derived from the in-house network:

- Troubleshooting terminal, line and port problems are simplified by hard-wire communication.
- Asynchronous transmission at up to 2,400 bit/sec has been found reliable, so users with applications (and terminals) which can use higher speeds can reduce connect time.
- The cable installation will be able to support an RJE station now being proposed for a central location on the campus.
- The cable installation will support central collection and conversion of analog signals from lab experiments, reducing the need for analog/digital conversion equipment throughout the campus.

Mild is computer center director at Humboldt State University in Arcata, Calif.

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Terminal Transactions

Bureau Finds Its Hand-Held Units Can Empty a Room

By Catherine Arnst
Of the CW Staff

BOSTON, Mass. – DP&W, Inc., a service bureau here, has a lot of empty space right now. A small, hand-held terminal has enabled it to replace five IBM 026 keypunches and seven telephone lines that filled an entire room with one phone, one tape drive and one employee monitoring the system.

DP&W handles the billing operations for doctors, dentists, clubs and several other commercial enterprises. It provides monthly and daily statements to let its customers know where their accounts stand.

When the 026s were in place, customers had IBM 1001 terminals in their offices which utilized punch cards for the information needed to prepare bills. The data from the cards was transmitted daily by an AT&T 401A dataset over telephone lines to DP&W.

Clients spent almost an hour each day transmitting the data, a process which was expensive both in dollars and time, according to Allan Holmberg, vice-president of operations.

CW Photo by C. Arnst

Allan Holmberg, vice-president of DP&W, displays the Pertec 1321.

The equipment being used was no longer being manufactured, so it was difficult to service and replace, he added. The time spent transmitting data was also a deficiency of the system, he said.

Replacement Requirements

The firm started looking for a replacement that met several requirements: low cost; easy operation, with a minimum of technical jargon for non-DP clients who would be using the unit; and communications capability that required a minimum of telephone connection time.

DP&W chose the Infopac terminal, manufactured by Azurdata, Inc. Infopac is a portable unit with a keyboard similar to a pocket calculator that contains four control keys. It has a detachable transmitting unit which is also portable and can be plugged into any outlet and attached to any phone, Holmberg said.

An operator, after inputting all the data desired, now dials up DP&W, where the phone is automatically answered and the data is recorded on a Pertec 1321 magnetic data recorder.

The terminal's buffers can hold up to 256 records and, if completely full, would take only 48 sec to transmit the data, Holmberg said.

With its old system, DP&W had to do some tight scheduling to prevent clients from getting backed up in transmitting data, he said. "There are 26 Infopac units in the field, and because the entire buffer can be emptied in less than a minute, we would never get backed up."

Few changes had to be made in the company's already existing equipment to adapt it to the Infopac. A special unit was developed by Infodata to load the information on the tape drive. This unit contains transmission indicator lights which alert employees monitoring the system to data errors.

The Pertec tape drive was already owned by DP&W and only needed a circuit board changed to adapt it from a keypunch to communications mode.

The data is processed by an IBM 360/30 and billings statements are compiled three times each month. Daily printouts are also produced for each client listing, each patient, the service received, amount owed and amount paid, which, if used properly, "can be a perfect audit trail back to bank deposits," Holmberg said.

"The reactions of the customers have been great. The newness was a cause of some resistance at first, but most are delighted," he said.

The savings in manpower for DP&W with the new terminals has been subtle, Holmberg said. The company has a small staff; those employees whose time was freed up with the new equipment consequently had more time to devote to other duties, he said.

The savings in dollars have been considerable. Monthly operating costs have been cut by approximately 80% and the system should cost-justify itself over a period of 32 months, he estimated.

Codon Extends 'Dataflow'

BEDFORD, Mass. – Data communications at up to 4,800 bit/sec between a general-purpose computer system and a network of Codon Corp. intelligent terminals is a feature of Codon's Dataflow communications software, according to the vendor.

Dataflow is the most recent optional extension to the company's OS800 operating system for its models 12 and 20 intelligent terminals, a spokesman noted.

The software can be used in on-line communication via synchronous data links to remote CRT terminals, hard-copy devices or document printers.

Dataflow reportedly can be used for applications requiring automatic daily transmission of a predetermined group of files and for remote program transmission and update of utility programs.

Dataflow costs $3,000, the spokesman said from 11 De Angelo Drive, Bedford, Mass. 01730.

Bank Hits Home for Apartment Dwellers With Automated Teller Unit in Lobby

By Toni Wiseman
Of the CW Staff

ARLINGTON, Va. – Virginia National Bank (VNB) customers living in Oakwood Apartments now have all the conveniences of home – because the bank is essentially in their homes.

VNB has installed an IBM 3614 automated teller machine in the 3,000-resident apartment complex's clubhouse.

The terminal, connected on-line to a host 370/158 CPU in Norfolk, allows VNB customers to deposit or withdraw funds from individual or multiple accounts at any time of the day, move funds between checking and savings accounts, pay bills and loans and obtain current account balances.

The installation also includes a phone which serves as a hot line to a cash flow operator at the main bank. The line is manned from 8 a.m. to 8p.m., after which a tape recoder is used to return calls the next day.

Terminal Transactions

To operate the terminal, the customer inserts an Ansi-encoded plastic card and punches in a four-digit personal identification number (PIN). If the customer fails to enter the right PIN after three tries, the terminal "eats" the card as a security measure against fraud.

Withdrawals are currently limited to $100 per day per card in $10 denominations. A husband and wife, for example, would each have a separate PIN and could therefore withdraw $200.

Acceptance has been "terrific" so far, the spokeswoman said, noting 40 new accounts were opened the first week after the terminal was introduced.

VNB is also enthusiastic about the automatic teller since it cost about $60,000 to install including the environment – in this case, oak-panelled enclosures.

The cost of establishing a branch, on the other hand, would range between $200,000 and $500,000, according to bank estimates.

VNB currently has 22 automated tellers in operation, 16 in branch banks and six in remote locations. Acceptance has been high everywhere, with a terminal in the Pentagon averaging 4,000 transactions each month.

Randal Designs Interactive Unit

TORRANCE, Calif. – Randal Data Systems, Inc. has added an interactive batch terminal with editing and search capabilities to its product line.

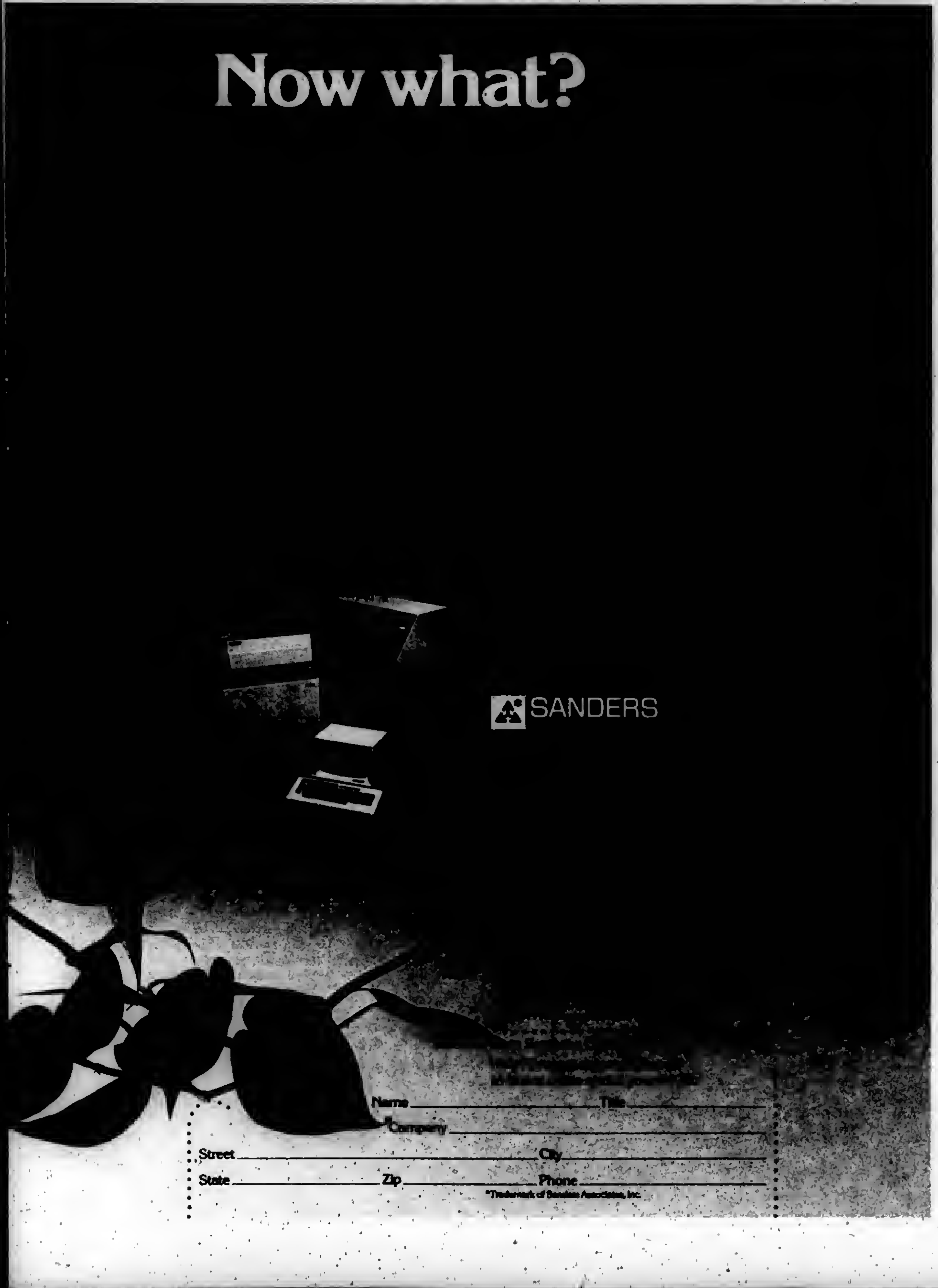
The RDS/FDR store-and-edit terminal is plug-compatible with CRT and hard-copy terminals through a full RS-232 interface capability and comes with flexible disk storage of 311K characters, the company said.

The device is capable of displaying only one line of text at a time on its LED display, with line identification and callup accomplished through a 10-key numeric pad, a spokesman added.

It can be controlled, however, from the host computer or from another terminal, he noted.

In addition, two switch-selectable transmission speeds within a 110- to 1,200 bit/sec range come as standard equipment, although options allow operation at speeds up to 9,600 bit/sec, he said.

The terminal comes with a $1,995 price tag for the basic configuration with custom configurations available, the company said. Randal is located at 365 Maple Ave., Torrance, Calif. 90503.



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HP Adds Micro-Based CRT for Local, Distributed Nets

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) has added an intelligent communications display station with increased display memory and additional editing capabilities to its HP 2640 terminal series.

The HP 2645A microprocessor-controlled CRT display station, designed for both local and distributed computing networks, can operate at selectable speeds up to 9,600 bit/sec.

It has the optional capability of asynchronous or synchronous multipoint polling of up to 32 terminals on the same line, the company said.

The terminal is compatible with most computer systems and reportedly is capable of sharing modems, data lines and computer I/O channels.

Additional options to increase data communications flexibility include 20mA current loop, split I/O speed and custom transmission rates, HP noted.

To simplify the use of the terminal keyboard and to adapt it to specialized applications, each of eight special-function keys can be set up to issue a user-defined string of 80 characters or several control sequences stored in the terminal, a spokesman noted.

Instead of using several key sequences, users can program a function key to initiate file searches, operator instructions, or forms construction for data entry, he added.

Prefix keys provide access to the 2645A's multiple data paths to allow information to be moved among the display station's tape cartridges, display, keyboard, printer and data communications interface, he said.

Other features include off-line data preparation and editing capability, microprocessor-controlled memory allocation, built-in self-test and a 1,920-character display in a 24-line by 80-column format, HP noted.

Optional cartridge tape transports provide 220K bytes of storage, allowing the unit to batch information and to perform operations normally requiring connection to a computer, according to the company.

The 2645A can have up to 12K bytes of multidisplay memory available to store forms, programs or text.

Up to four 128-character sets – said to be switchable on a per-character basis – may be used concurrently, including a Roman set and line-drawing, mathematics and accessory sets.

Base price for the HP 2645A display station is $3,500; when equipped with cartridge tape transports, the price is $5,100. Deliveries are scheduled to begin in September, the company said from 1501 Page Mill Road, Palo Alto, Calif. 94304.

Terminal Transactions

Unitech Has Programmable Unit

AUSTIN, Texas – The UT-2, a programmable remote batch terminal, is available now from Unitech, Inc.

The terminal includes a Unitech 12K-byte communications processor, card reader, synchronous communications adapter, cabinet, choice of three types of consoles, choice of three line printers and software for operating the terminal with customer-specified host computers, including IBM, Univac and Control Data Corp. systems, Unitech said.

Part of a family of terminals, the UT-2 is software-compatible with larger capability Unitech machines. It operates at speeds up to 4,800 bit/sec with EIA RS-232C compatible modems, a spokesman added.

Consoles available with the terminal include a choice of 10 char./sec Teletype; CRT display with Ascii keyboard entry and 25-line by 80-position data format; or a 7X7 dot matrix keyboard printer with 132 columns, 64-character Ascii and 10-, 15- and 30 char./sec operation.

Printers offered with the UT-2 are 60- to 200 line/min, 132 print position, 5 by 7 dot matrix, 64-character Ascii; 125 line/min, 132 print position, 9 by 7 dot matrix, 64-character Ascii; or 300 line/min, 132 print position (136 optional), 64-character Ebcdic (no-cost option is 64-character Ascii), 6- or 8 line/in. vertical spacing.

The terminal is said to cost "less than $700/mo" from Unitech at 1005 East St. Elmo Road, Austin, Texas 78745.

Insurer Builds Net To Allow for Future

(Continued from Page 21)

foreseeable future, many additional services that neither the company nor the insurance industry have ever offered its field offices and independent agents.

When a call is made by the agent to one of the branch offices, the customer service representative activates the appropriate system by typing in the correct policy number. Basic policy and account information is provided in seconds and relayed to the agent.

Alphabetized Program

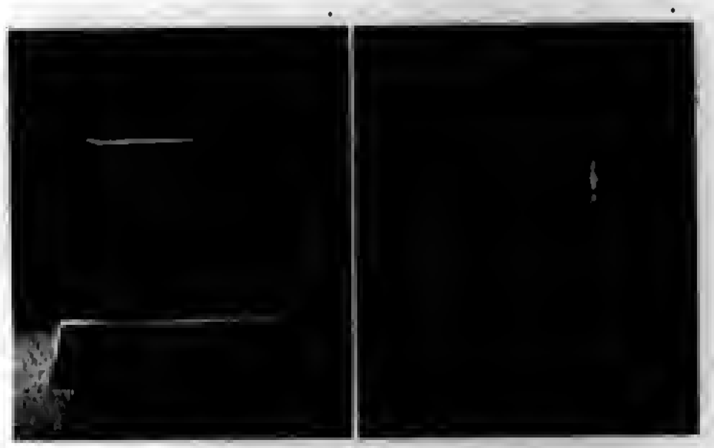
If the policy number is not readily available on an automobile policy, the system is capable of providing the same information by use of an alphabetized program whereby the name and address of the policyholder are required, he said.

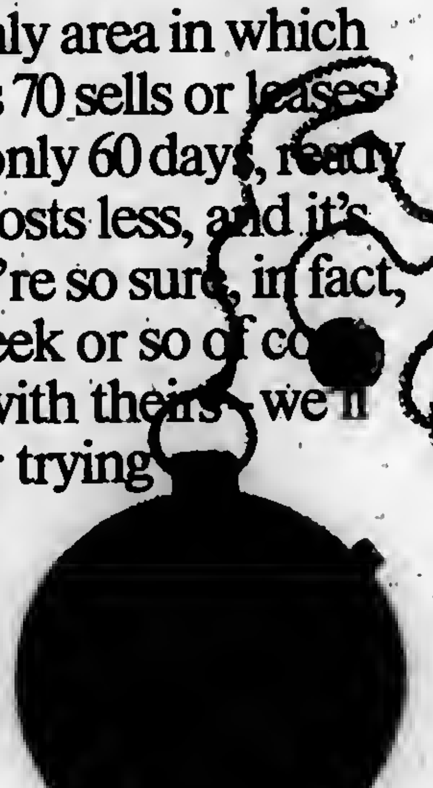
Additionally, if the actual policy documents that need to be examined are on file in another office, the system relays a message to the appropriate office where the document review is conducted and an answer is sent back to the requesting office via CRT message switching

Just One Phone Call

The agent or policyholder is contacted and the answer to the question or resolution to the problem is given. In this manner, only one phone call to CNA is required and the response is available in a minimum amount of time, Avignone said.

In summarizing the system, Avignone commented CNA "is really just scratching the surface" and cited the additional applications which are placed on the system "every day."





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Bits & Pieces

Gould Printer/Plotter Works With 11-In. Coated Paper

CLEVELAND – An electrostatic printer/plotter from Gould, Inc. is said to produce high-contrast images of computer-generated graphics and alphanumerics on 11-in. wide coated paper.

The Gould 5005 prints 1,600 line/min (132 char./line) with a 64-character set and plots graphics at a maximum speed of 3.25 in./sec.

Resolution is 100 dot/in. overlapped, horizontal and vertical, the company said.

Key to the Image quality of the Gould 5005 is an electrostatic writing system which includes a staggered-stylii writing head, a matrix approach to putting dot charges on paper and the design of the paper itself, a spokesman claimed.

On-line direct memory access Interfaces are available for IBM 360/370, Digital Equipment Corp. PDP-11, Hewlett-Packard 2100 and Data General Nova/Supernova computers. Software includes a Plot graphics package and specialized application packages.

The price of plotter with print option is $7,560; the plotter alone costs $7,060 from the firm at 3631 Perkins Ave., Cleveland, Ohio 44114.

Data Loader Reads at 350 Char./Sec

LOS ANGELES – The Model 640 Data Loader series of paper tape readers from Addmaster Corp. can read standard 5-, 6-, 7- or 8-level tapes with no adjustments at 350 char./sec, the company said.

The readers employ LED light sources and hermetically sealed phototransistors.

The outputs available for each model in the series include: Model 640-1, Schmidt triggered CMOS amplifiers and TTL-compatible drivers; Model 640-2, Schmidt triggered CMOS data amplifiers; and Model 640-3, which has only phototransistors.

A single unit is priced at $151 and delivery takes two weeks. Addmaster is located at 416 Junipero Serra Drive, San Gabriel, Calif. 91776.

Carrying Case Protects Modules

PALO ALTO, Calif. – A reinforced interlocking aluminum valence that gives rigidity and strength and a polyethafoam-molded interior lining are said to be the protective features of a Data Module Case offered by Tab Products Co.

The Model 4802 weighs 15 lbs and measures 21-in. by 9-in.

The black case carries a single IBM 3348 module and is priced at $79.50 from Tab at 2690 Hanover St., Palo Alto, Calif. 94304.

$900,000 Savings Expected

Center Ties Amdahl CPU With CDC Gear

CINCINNATI – It was inevitable that sooner or later Amdahl's IBM 370 plug-compatible CPU would go into an installation with IBM plug-compatible peripheral gear.

That's just what happened at the Southwestern Ohio Regional Computer Center (Sworcc) here, which predicted the savings from the move will total "hundreds of thousands of dollars over the next five years."

The service center, located at the University of Cincinnati, sold its IBM 370/168 and purchased an Amdahl 470V/6, according to Dr. Robert Caster, Sworcc director. The center already had a string of 18 Control Data Corp. 33302-11 double-density disk units and attached them to the Amdahl system.

The savings from the Amdahl system should amount to $700,000 over the next five years, Sworcc officials said, while the savings on the CDC disks compared with similar units from IBM will amount to $170,000 to $200,000 over the same time period.

Caster based his prediction on savings he expected to accrue from improved cost/performance ratios and reduced overhead.

Supports 209 Terminals

Sworcc is a consortium formed in 1972 by the University of Cincinnati and Miami University, located 35 miles away at Oxford. The center serves the administrative and academic functions of both universities as well as a number of other nonprofit organizations.

The Amdahl 470V/6 at the University of Cincinnati's medical center campus supports nine remote job entry and 200 interactive terminals of various types. The terminals are located on the main and branch campuses of both universities and at a number of other user sites in the Cincinnati-Oxford area.

The University of Cincinnati is the second largest employer in the region. Caster, in addition to his duties as director of the computing center, is also assistant vice-president of business and administrative services for the University of Cincinnati.

Vendor Harmony

Happy with his multivendor installation, Caster said that maintenance personnel of the two vendors, Amdahl and CDC, work in complete harmony. "Reliability and maintainability are the best they've been in years," according to Caster.

Sworcc has been growing steadily since its founding when it replaced an IBM 360/50 at Miami University and an IBM 360/65 at the University of Cincinnati. The two installations were combined in 1972 with a single IBM 370/165, upgraded to a 4M-byte 168 in 1974.

In addition to pioneering with the Amdahl/independent peripherals combination, Sworcc will be one of the first installations with an independent CDC 38500 mass storage system.

On Aug. 16, the CDC 38500 was delivered to the center. "Data processing has been waiting for years for this development," Caster said. "It's going to replace tape to a great extent at Sworcc, and the 16G-byte added storage capability will let us expand our services considerably.

Improved Efficiency

"Efficiency will improve, too," he added, "because where it takes one to five minutes to select and hang a tape, with the CDC mass storage system we can be on-line in a maximum of seven seconds."

The CDC 38500 provides users with on-line storage of large data bases at what the vendor said is a fraction of the cost for traditional rotating storage methods. The first unit was shipped to Lawrence Livermore Laboratory in Livermore, Calif., in June; volume production of the device is slated to begin late this year.

Sworcc was selected as the first open test site for the CDC 38500 because of its diversified application base and the opportunity it offered to test the system's performance with the equipment of several vendors.

In addition to the Amdahl mainframe and the CDC disk drives, the center uses IBM tape drives, a Comten Communications controller, Singer remote job entry stations, Hewlett-Packard 2000 and Modular Computer Systems, Inc. minicomputers, California Computer Products, Inc. plotters and a mix of CRTs and other terminals from several vendors.

"It's a completely harmonious relationship among the vendors," Caster said.

A staff of 165, Including 90 analysts and programmers, keep Sworcc running 24 hours a day every day but Christmas Eve and Christmas Day.

Sworcc is located a mile and a half from the main University of Cincinnati campus in the medical-science complex near Cincinnati General Hospital. It serves such diverse users as instruction and research departments, university administration, the medical school and hospital, local high schools, Mt. St. Joseph College and several government agencies.

For its two major clients – the universities of Cincinnati and Miami – Sworcc handles all phases of administrative services: accounting, payroll, personnel records, budgeting and student records.

It provides interactive computer-aided instruction, interactive computing and batch processing for a student enrollment of 50,000 students at both universities.

In support of the University of Cincinnati Medical Center, Sworcc, for example, assists the Department of Radiology in tumor therapy treatment planning. It augments cancer therapy by helping the radiation physicists in the irradiation of lesion sites via cobalt or high-energy X-radiation with a high degree of accuracy.

Still, there is computer capacity left for processing work from federal agencies as a means of helping to pay operating costs of the center. Currently, Sworcc is providing systems design and programming support services for the Environmental Protection Agency and the National Institute for Occupational Safety and Health, systems conversion for the U.S. Postal Service and scientific data processing for Wright-Patterson Air Force Base in Dayton.

Ball Adds Remittance Processor

SUNNYVALE, Calif. – Ball Computer Products has introduced the Readoc Mark IV, an automated remittance-processing system which the vendor said can read optical character recognition (OCR) documents or punched cards, audit trails checks and remittance documents and endorse checks and encode them in magnetic ink character recognition (Micr) symbols.

A typical Readoc Mark IV system consists of a CPU with 64K bytes, a 5.8M- to 50M-byte disk drive, magnetic tape drive and one to 32 Readoc terminals and/or CRT key entry stations.

Each Readoc terminal is composed of a CRT, keyboard, punched card reader or OCR reader, document transport, Micr encoding unit, check transport, check endorser, audit trail units and multiple microprocessors for control, Ball said.

"Readoc Mark IV pays for itself by saving the user money," a Ball spokesman claimed. "In an operation handling a minimum volume of 10,000 payments daily, processed on a one-shift basis, Readoc can save the user $1,500 per 100,000 payments processed per month."

Each terminal is operated by a clerk who separates the remittance document and the check. The remittance document is placed in a reading station in the terminal; the clerk keys in the amount of the check and places the check in the terminal's check-processing station.

A typical Readoc Mark IV system, including central minicomputer and three Readoc terminals, costs $4,000/mo on a five-year lease from 860 E. Arques Ave., Sunnyvale, Calif. 94086.

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CDC Adds 6,250 Bit/In. Systems For Users of IBM Tape Drives

MINNEAPOLIS – Control Data Corp. has added 6,250 bit/in. tape systems to its IBM replacement line for users of IBM 3420 models 4, 6 and 8 tape drives.

Prices are said to average 21% below IBM for purchased systems and 5% less for systems leased and maintained on a three-year basis.

The CDC 38032/34202 systems include 7- and 9-track transports with recording densities of 556-, 800, 1,600 and 6,250 bit/in. at tape speeds of 100-, 150- or 200 in./sec.

A CDC controller handles one to eight 34202-4, -6 or -8 transports intermixed in any combination, according to the firm.

Optional features allow the connection of two, three or four controllers with combinations of up to eight or 16 intermixed drives.

A two-channel switch option is offered for installation with multiple large-scale IBM 360/370 CPUs.

Purchase and lease prices for the CDC 38032 controller are $34,100 or $682/mo on a three-year contract.

A 34202-4 transport can be purchased for $17,400 or leased for $363/mo. Prices for model 6 and 8 transports are $20,500 and $23,950 respectively, or $436- and $483/mo.

Customer deliveries are scheduled for the first quarter of 1977 from CDC at Box O, Minneapolis, Minn. 55440.

German Bank Finds On-Line COM Cuts Time of Record Production

MANNHEIM, W. Germany – To cope with the ever-increasing volume of paper required by the many records which a bank must keep, the Stadsparkasse savings bank here decided to procure an on-line computer output microfilm (COM) system.

The bank chose a California Computer Products, Inc. (Calcomp) 2100 system, which can operate with either 16mm microfilm or 105mm microfiche.

This on-line COM printer prints up to 13 times faster than line printers, so the time saved in record production is considerable, R. Vietz, a bank official, said.

Print Time Saved

"Our experience with the COM system has been very positive. The system can handle a print volume of 600,000 to about 900,000 lines per hour, and so far the 2100 system has saved the bank an average of four and a half hours of print time on our IBM 370/145 every working day," he stated.

The bank uses the system's 105mm microfiche capability for several reasons, Vietz said.

Microfiche can be stored in standard index card files, in cabinets or even in desk drawers; access to desired information is extremely fast because of the small size of each fiche and because of fiche's design, he explained.

Another advantage of microfiche for the bank is its ease of duplication. Many departments can now have the same information in easily usable form at low cost, Vietz said.

Savings Estimated

"We estimate the bank saves each month more than $20,000," he said. "Principal areas in which we have saved money because of the COM system are decreased print workload for our 370/145, drastically reduced paper consumption and decrease in the number of personnel required for traditional record-keeping."

REI Modifies Trace For Insurance Firms

DALLAS – A version of the Trace optical character recognition (OCR) system specifically modified for insurance payment processing applications has been introduced by Recognition Equipment, Inc. (REI).

With the Trace configuration, insurance companies can eliminate the need to batch balance premium payments because the system has the capability to read and balance both single and multiple statements in a single pass, the company said.

Basic Configuration

The basic system consists of a 12-packet data capture transport, with a constant-speed, 1,200 document/min feeder, a single-font optical character read station and recognition unit, a subsystem controller and CRT unit and two dual-density, 9-channel, 800/1,600 bit/in. and 25 in./sec tape units.

Trace can accept intermixed sizes and weights of paper with tears, staples, dog-ears and pasted labels, the firm said.

By including a microfilming option in the configuration, both premium statements and checks can be microfilmed at processing speeds in the sequence in which they are paid, the company added.

System Options

Options to the basic system can include up to four additional 8,192-word modules of core memory, Micr reading of an E13B font; two additional six-pocket transport modules, a Hollerith mark sense reader, three additional OCR fonts, an upgrade of the basic single font to 40 additional character patterns, a microfilm module, a programmable image number, automatic film advance and selective microfilming, 300-, 490 or 900 line/min printers, two additional tape units, 5M- or 10M-byte random-access disk units and a reject reentry feature.

Capture Transports

With selected options, capture transports can be used for Micr, OCR and Hollerith mark sense, capturing data on tape, microfilming and distribution of items on the same pass.

The price of each system varies with the configurations and options chosen, and it is available immediately, REI said from P.O. Box 22307, Dallas, Texas 75222.

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Users can rent, lease or buy both the printer and controller. And we are ready to work with systems designers of distributed computing, too.

For full information, call or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, N.Y. 11797. (516) 575-3034. Telex: 96-1430.

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Baker Benefits From Terminal Ingredient

ELMHURST, Ill. – For more than 50 years, the Keebler Co. has prided itself on making quality baked goods. To reach that goal, its 7,500 employees have always devoted personal attention to customers – from the actual cookie making to the distribution of its goods to the grocery shelf.

Information Systems Vice-President William Dierkes noted that in early 1974, the company identified several areas where computerization of activities at seven bakeries and 63 distribution centers, spread across 45 states, would support those efforts.

To automate its inventory replenishment process and bakery office functions such as payroll, provide for more efficient handling of sales orders and give timely management reporting, Keebler, the second largest cookie/cracker company in the U.S., added Sycor, Inc. Model 340 terminals into its management information system.

The system has justified itself in personnel savings alone and facilitates processing of orders and generation of accurate sales invoices – post-invoice adjustments have been reduced tenfold.

It is on the way to reducing a finished goods inventory of $30 million by 15% as well as giving management a tool with which to control its distribution and production of goods. Today Keebler has 70 Sycor terminals and printers installed at as many remote facilities.

First Installed at the company's bakeries, the terminals replaced a manual stock status record-keeping system where the bakery clerks accounted for the finished goods inventory and shipping requirements based on order Information mailed from the distribution centers.

By using the terminals, information from the bakeries is transmitted, at 2,400 bit/sec, to the corporate computer center in Elmhurst, where it is received by a master station Model 340 with a 1,600 bit/in. magnetic tape drive.

The tapes are then processed by dual Burroughs 6700 computers and the output is forwarded daily back to the bakeries where stock status, orders, transactions, production schedules and inbound shipment reports are printed out on the attached Sycor printers.

Payroll clerks no longer have to manually calculate wages at the bakeries, either. Using the terminal's programmable features, and a specially created assembler program, the clerk merely keys in the information such as maintenance and rate changes; the terminal validates all transactions before the data gets to the B6700.

While the bakery system was being installed, an automated order entry/invoice processing/inventory control system was being set up to relieve the distribution center staff of manually extending the totalling orders; summarizing sales; and forecasting inventory requirements.

The system presently processes 8,000 orders a day from the 63 distribution centers. At scheduled times, the master station unit dials the remote terminals and receives the sales order information.

Invoices are generated on the B6700 and transmitted back to the terminal for printing the same day. Other reports available at the distribution centers Include a complete stock status report, inbound shipments schedule and sales summaries by salesmen and product.

The CPU is able to maintain current inventory levels and automatically adjust and forecast the following week's orders. According to Dierkes, the computerized system has helped resolve many of the logistics problems that used to be imposed by the old system.

Customers are getting accurate invoices because the branch office-entered data is error-free – the terminal does not allow Invalid customer or product numbers.

Keebler's sales management can also keep track of sales by getting a complete summary of each day's order input, noting what will be shipped that day, how well promoted products are doing and the status of individual salesmen.

Because of the location of some of the distribution centers, reliability of the terminal system and the ability to service it became a major requirement.

A field service survey just completed covering the first half of 1976, for all remote terminals, showed the following results: 190 system failures, 58-day mean time between failure, 80% of the systems were back in operation in five hours or less; 95% within eight hours; for a total uptime of 98.5%.

The automated system has the flexibility for Keebler to begin planning new applications. For example, by capturing the manufacturing site and date of production for each pallet of product produced, the system will help ensure that each package of crackers and cookies is as fresh on the grocery shelf as it is when it leaves the bakery.

Auto Parts Supplier Saving $700/Mo With COM System for Archival Records

KANSAS CITY, Mo. – Western Auto, with more than 5,000 stores nationwide, is saving $700 monthly in rentals by installing an on-line computer output microfilm (COM) system for generation of archival records.

The Memorex 1600 system is connected directly to an IBM 360/65 system running under OS in the company's headquarters, and is used for producing historical business records. The microfilm records permit access to both recent and archival records.

According to Robert K. Washburn, director of management information services at Western Auto, the on-line COM unit has many advantages. First, it replaced a printer, controller and continuous form microfilmer, which had a $700/mo greater rental rate than the monthly cost of the Memorex system.

In addition, Washburn estimated significant savings in expendable supplies. "Figuring very conservatively, solely on the basis of one-ply paper forms compared to film and film chemical costs, we were able to justify purchase of the Memorex system. Paper Is roughly $3.25 per thousand pages, or 50% more costly than film," Washburn said.

Western Auto uses the COM system to produce more than half-a-million frames (pages) of microfilm each month. These outputs, produced at a rate of about 10,000 line/min contain historical records of retail credit statements, inventory and vendor reports, management information reports and accounting department financial statements and price lists.

With more than 3,000 items for sale in its many owned and franchised stores, these reports are often quite voluminous.

Pocket-sized microfilm cassettes instead of bulky paper reports are now sent to the company's 10 distribution centers around the country, saving in postage, delivery time and in storage space. Each cassette, the size of a one-inch stack of tabulating cards, contains a month's records which would comprise a cumbersome 1,000-page pile of paper.

Six Memorex 1644 viewers are used to display the microfilm records, and one Memorex 1650 viewer/printer at the company's headquarters is used to produce hard copy from the film, should that be necessary.

The reports are used by sales people at the distribution centers to evaluate store buying patterns, to review vendor arrangements for return of goods, and to determine inventory trends over long periods. An on-line inquiry system is used by the company to provide current information to the distribution centers and to chain store managers.

The COM system was placed in exactly the same location in the shop where the hard copy printer had been. "It was installed," Washburn said, "with hardly a ripple in the shop."

Before selecting the Memorex system, Western Auto evaluated various microfiche systems, but a survey of users revealed a preference for cassettes which are easy to use.

Exerciser Tests 2315-Type Drives

FULLERTON, Calif. – A series of switch-selectable tests ranging from simple restore operations through complex data exercises can be performed on IBM 2315-type disk drives from Wangco, Pertec and Diablo by the DX-1000 disk exerciser from Wilson Laboratories, Inc.

Functions include restore, seek, seek incrementing, decrement seek, increment or decrement up or down the disk and random patterns of incrementing.

The DX-1000 is priced at $1,995 from the firm at 2536-D East Fender Ave., Fullerton, Calif. 92631.

-ANNOUNCEMENT-
KEY-PUNCHING

Edward Robbins, Director of a major U.K. key-punching/key-to-disc bureau, will be in the U.S.A. late September/early October to discuss large volume key-punch contracts to be carried out in the U.K. at very attractive rates. If you are interested in discussing the placing of a high volume data-prep contract please write or call to make an appointment at:

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Page Printing System Makes Food Coop's Life Easier

By Bernard Hill
And Ernest R. Truax
Special to Computerworld

LOS ANGELES – In January 1975, Certified Grocers of California became one of the first organizations in the country to install a Honeywell Page Printing System (PPS). By early 1976, the giant cooperative was using two PPS to produce some 1.3 million pages per month for distribution to its members and for use in its own offices here.

Like most PPS users, Certified first became intersted in nonimpact printing as a better way of performing traditional DP operations. Jim Shiffermiller, Certified's manager of computer operations, made the analysis that started Certified toward the use of nonimpact printers.

"We wanted reports that had consistently good print quality," Schiffermiller explained. "We wanted to eliminate problems with readability such as characters dropping out because a print hammer misfired. We wanted to eliminate the fuss over who got originals and who got copies. We wanted smaller reports that would be easier to file – and less expensive to mail to members.

"And I particularly wanted to get rid of the storage and handling problems that were accumulating as we used more and more preprinted forms," he added.

Certified worked out methods for attaining these goals in several stages. In the first stage, originals were printed on line printers and then each page was photocopied manually. Then the company moved to a slow-speed nonimpact printer and finally the PPS.

As experience was gained, Certified expanded the original goals. "Today, we are doing things that wouldn't be possible with a line printer," Shiffermiller said. "For example, take a look at our retail catalog."

The retail catalog is one of the most basic media for communication between Certified and its members. It gives the member a list of items he can order and his prices for those items. The member marks up the catalog to show his order quantity for each item and returns the marked-up document to Certified.

"With the PPS, we can produce individualized catalogs for each member. We individualize catalogs by selecting only those items the member has made a policy of ordering and then indicating his costs, mark-up and retail price for each of the items," Shiffermiller said.

"Individualized catalogs help the members, but they create a data processing problem," he added. "We print catalogs weekly and over the period of a month we print around 1,500 different catalogs, each 25 to 50 pages long. And, to further complicate matters, we print a variable number of copies of each catalog.

"It's probably not possible to handle that kind of job with a line printer," he said.

Satisfied Users

Shiffermiller has found other uses for that speed. "I've just conducted a survey of about 150 of our users to test their satisfaction with our computer operations. Only three indicated they were not receiving their reports quickly enough. A couple of years ago, we would have had many more complaints."

Most of the print load at Certified is generated between 11 p.m. and 4 a.m. Shiffermiller's goal is to deliver those reports at 6 a.m. "The PPS is making that possible. It prints, cuts the paper, punches holes and collates the reports. It's eliminated decollating and bursting – and we had several jobs when these operations were a major bottleneck.

"In a few cases, the improvemenet has been spectacular. For example, the is a long report we produce monthly in 35 copies, called the Merchandise Movement Analysis.

"We used to print, decollate and burst that report as we had time, and it would sometimes take seven days to complete it," he said. "Now it's printed and distributed within 24 hours after the print tape is ready."

The history of Certified's transition to the PPS can be traced to 1970 when Shiffermiller decided to use off-line devices for printing. At that time, Certified had two Honeywell 3200's with six on-line printers. After studying the operation Shiffermilier concluded the 3200 throughput was slowed by the volume of console activity connected with printing and the need for operators to service the printers.

His first move was to acquire off-line impact printers. Next, he implemented a policy of printing reports on one-part stock and then making copies and adding fixed overlay data at the photocopier.

Certified realized several advantages here. These steps reduced the number of preprinted forms that had to be kept in inventory and, therefore, they reduced the investment in paper inventory and the storage space required; they reduced the work involved in transporting preprinted forms to and from the warehouse area; and they reduced the losses caused when a form became obsolete.

The next step was to eliminate the need to manually photocopy each report. Certified then acquired two 4,000 line/min non-impact printers that accepted magnetic tape input. Then, in January 1975, Certified installed a 12,000 line/min PPS with 16 stackers.

At the same time, the software on Certified's CPUs was expanded so that instructions for running the PPS without operator intervention could be attached to print files.

In January 1976, Certified installed a second printer with 24 stackers and a hole punch. By early April the two PPS systems had absorbed the workload for non-impact printing and the other devices were returned.

Certified currently handles its processing on two Honeywell 2070's. It writes PPS print tapes directly from application programs.

Each PPS is staffed with an operator assisted part-time by a second person.

Certified continues to use off-line impact printers purchased several years ago and is using microfiche for some reports.

PPS output has generally been accepted well throughout the company. Shiffermiller reports "no complaints recently" although there was objection to the odor of early versions of PPS paper.

PPS has absorbed the major share of Certified's printing load and is printing a wide variety of reports for members and internal users. Jobs being run on the PPS and being planned for the future include invoice and picking tickets, warehouse reports, and profit incentive memos.

Certified is also planning more extensive use of the support programs for the PPS which are run on the Honeywell 2070 mainframes.

The support programs allow the labeling of report data with control block information which directs the flow of reports to the Page Printing System.

Hill is an instructor at El Centro College in Dallas and a consultant. Truax is a senior staff engineer for Honeywell Information Systems.

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System Proves a 'Real Plus'

Insurance Firm Chooses Decentralized Data Entry Policy

RALEIGH, N.C. – Switching to a decentralized data entry system has proved to be a "real plus" for Durham Life Insurance Co. here, the user said.

"In my 25 years experience in DP, I believe that decentralized data entry is the best thing that ever happened. Before we brought in our new system I was spending a lot of my time trying to calm down irate department managers wondering why reports were late," according to John B. Gray Jr., vice-president for DP.

"They didn't realize that in many instances the problem originated with their own departments in handling the source data and getting it to the computer center. Now I've got more time to do planning and budget preparation."

The equipment operated by Durham Life is a Univac 1900 Computer-Assisted Data Entry System (Cade) with 25 keystations located throughout the firm's headquarters.

The system includes two processors, one with 88K bytes of memory, the other with 96K bytes. The configuration also includes a dual disk system with 2.2M bytes of storage on each drive, two magnetic tape drives with a data transfer rate of 30K bytes and two printers operating at speeds of 200 line/min.

Twelve of the keystations are attached to one processor with the other 13 linked to the second processor.

The Cade system is a shared processor key-to-disk system with final output on magnetic tape ready for computer processing. Each keystation in Cade is equipped with a visual display which guides and instructs the operator and allows up to 32 format levels.

The processor gathers the keystrokes from the data entry stations during entry, verify, update, search and modify modes. It then translates these signals into the equivalent processor characters or function code, displays them on the video screen of the originating station and assembles them into fields, records and pages.

Data prepared on the Cade system can be processed on the company's mainframe computer, a Univac Series 70/45 system with 262K bytes of main storage capacity. The 70/45 system includes eight disk drives, eight magnetic tape units, two printers, a card reader and a card punch.

The computer processes 48 applications including individual policy administration, policy reserves, policy loans, mortgage loans, general accounting and payroll.

Most of the 25 Cade keystations are located in five user departments – Accounting, Policy Service, New Business, Group Insurance and Credit Insurance. The remaining units are used by Data Entry Control with three keystations, and Programming, with one machine.

Data Entry Control is responsible for all supervisory functions. In addition, it handles all keying for users without their own equipment or with insufficient volume to justify installation of their own keystations. Programming uses Its station to develop new programs planned for the future.

The largest user department is Credit Insurance, which has eight keystations to handle a large volume of premium accounting, claims and general administration.

Policy Service utilizes five keystations for individual policy administration, entering changes in existing policies (such as change of address, beneficiary, etc.), file maintenance, premium accounting and policy loan administration.

Accounting has four keystations and one printer, which prepares checks for all payments, policy benefits, settlement of claims – virtually all checks except the company payroll.

Two keystations are employed by the New Business department for new business processing and to keep track of applications for insurance from time of receipt until the policy is issued. This department also handles some work in the policy issuing area. The remaining user, Group Insurance, has two keystations for processing premium accounting claims and administration.

Durham Life handles a full range of ordinary and industrial life, accident and health policies, group insurance and credit insurance. The company operates in 32 states and has 28 district offices.

A subsidiary, State Capital Insurance Company, handles all types of fire and casualty insurance, while another subsidiary, Durham Life Broadcasting Service, Inc., operates two radio stations in Raleigh.

It inaugurated a four and a half-day workweek of 35 hours for its employees. User departments key data into the system from 8:30 a.m. to 5:30 p.m. Monday through Thursday and from 8:30 a.m. to 12:30 p.m. on Friday. Data Entry Control operates from 7:30 a.m. to 6 p.m. daily, Monday through Friday, with one shift on a Monday to Thursday cycle, and the other working from Tuesday through Friday.

Until recently data entry at Durham Life was centralized in an area adjoining the computer center. The system used eight Inforex 1301 key-to-disk stations and 14 IBM 129 keypunches.

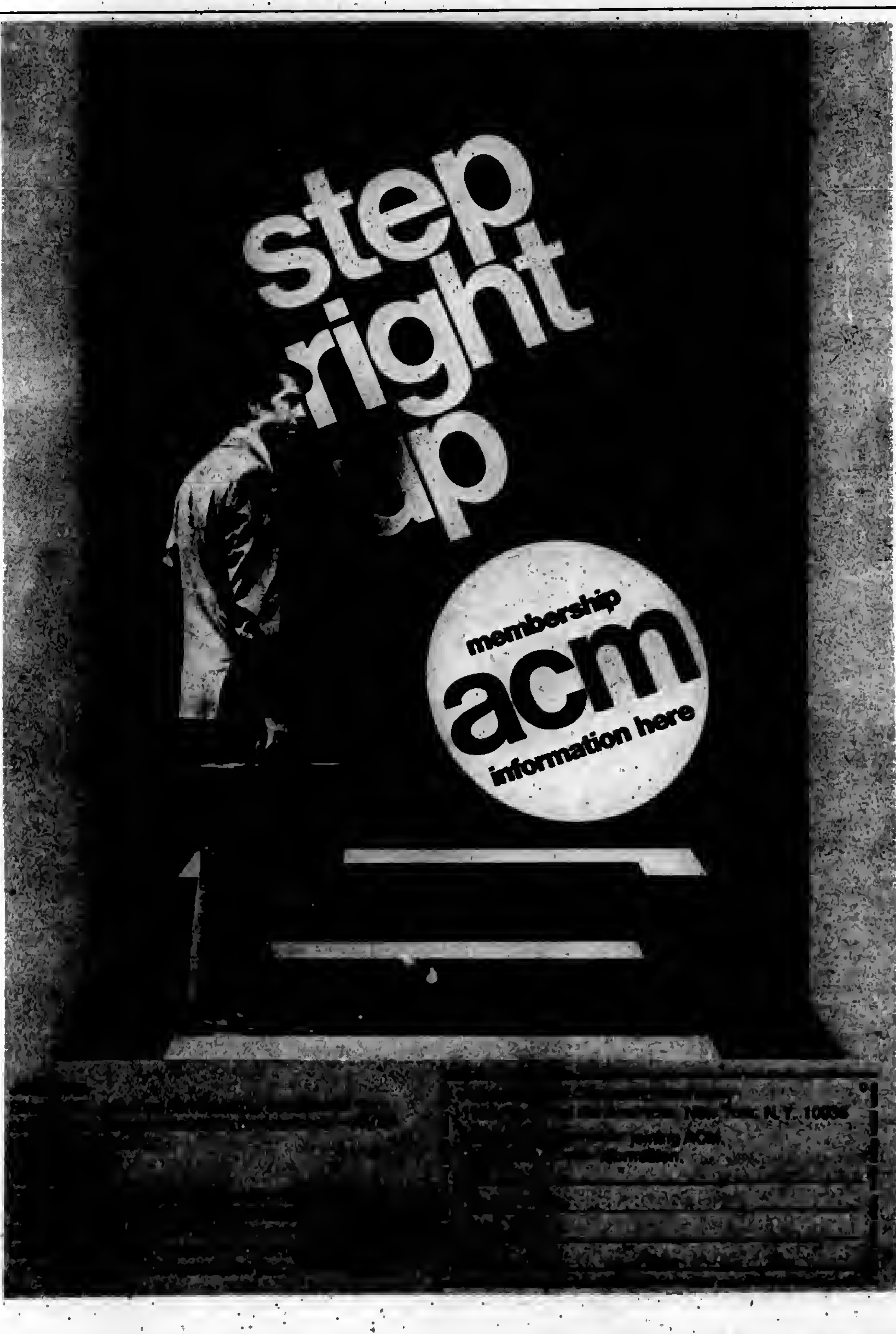
A major drawback to this system, Gray said, was that data entry personnel were continually going back to the originating departments to run down incomplete data or check on errors.

"There was also the problem of transporting source documents from individual department areas to the data entry section," he added.

"Apart from the time lag, a document would occasionally get lost in transit. Now that's eliminated; the documents stay in the user's area and because they don't leave the department the chance of their getting lost is extremely small."

Another benefit Gray pointed out is a smoothing out of the mainframe computer operation with scheduling much less of a headache than it used to be.

"We've found that we're having virtually no delays in getting jobs out since we went to the decentralized system. The jobs are now balanced by the user before they go to data processing," he said.



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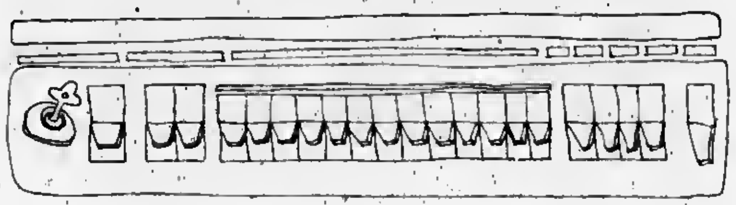

a computerworld special report aug 30, '76

Distributed Systems Slash Costs, Smooth Operations

By Esther Surden
Of the CW Staff

TROY, Mich. – Nine minicomputers in parts depots around the country connected to a mainframe here are providing Ford Tractor Operations with smoother operation, reduced costs and quicker response time to user requests, according to Albert Santoni, manager of the systems control department.

The Burroughs Corp. B772 minis replaced stand-alone IBM 3s in parts depots in Detroit; Atlanta; Memphis; Kansas City, Mo.; Albany, N.Y.; Minneapolis; Oakland, Calif.; Richmond, Va.; and Dallas, Santoni said.

The primary reason for switching from the IBM minis was to increase communications capabilities, he noted.

Little Communications

"There was very, very little communications between the 3s and the central computer; about the only thing we did was send them messages once in a while. Otherwise they were self-contained computers.

"We did the programming for them centrally, but they were operating all by themselves at the individual depots," he said.

Bids went out to IBM, Burroughs and Honeywell with only IBM and Burroughs responding, Santoni recalled. Burroughs was the low bidder and gave the firm some assistance in converting the old programs from the IBM RPG systems to the Burroughs Cobol, he added. That was in April 1975.

Santoni had also had experience on Burroughs systems at another Ford division and "was rather familiar with its capabilities as far as data communications goes and the ease of using the computer for time-sharing.

"We of course wanted to do other applications with the computer we could not do very cost-effectively with an IBM 158. We looked at Time Sharing Option (TSO) on the 158 and it just looked too costly where with command and edit langauges (Cande) on the B7700 it became a less costly deal."

Conversion Process

The conversion process, which began last November, was a well-planned affair with the user depots working very closely with the central planning group, Santoni said.

"We had weekend conversions," he added.

"All business on the 3s would be finished through Friday night, and on Saturday "we would take the inventory that was maintained at the depots on disk, fly it to Detroit and go to a 3 that had disk-to-tape."

The tape would then be carried to the B7700, dumping the inventory into the system. All the orders the depot received on Friday would be run Saturday night and Sunday, so that by Monday morning there was paper so the picking could begin," he said.

The operators were trained at an already-working stie, he noted.

The Ford Tractor configurations include a B7700 CPU with 1.5M bytea of memory, two disk file controllers, a card reader, card punch, four printers, eight tape drives, eight disk storage drives with two packs each and a data communications processor with 24K of memory accommodating 32 lines. It is costing $55,000/mo on a six-year lease.

The minicomputers are B772 models with 32K of memory, a printer, dual disk drives, 80- and 96-column card readers, a card punch and one 400 line/min printer.

Another minicomputer, a B761 without disk, is used at the central facility for program development, Santoni explained.

The nine systems cost about $2,000/mo each on the six-year lease, he added.

Unit-Down Orders

The systems are used to send what Ford calls "unit-down orders" and stock orders from tractor dealers. The unit orders are small-quantity orders needed to get a tractor repaired quickly while the stock order is used to replenish a depot's parts supply.

The unit-down orders are transmitted about four or five times a day. The central computer compares the orders with the on-hand position of the particular requesting warehouse and, if it should be on-hand, sends back a picking ticket and shipping and management reports for that particular batch, Santoni said.

If the item is not in stock, it refers the warehouse to another close warehouse that has the item.

In the evening, the stock orders are sent, processed during the night and in the morning the picking tickets are ready and the merchandise is shipped, he continued.

The main depot in Detroit has about 70,000 different part numbers in stock. The smaller depots each keep about 24,000 parts in stock. Each depot handles from 800 to 5,000 line item/day for the unit-down and 40,000 to 60,000 items on the stock orders, he noted.

The orders are transmitted over

(Continued on Page S/8)

Why a Mini?

So you have a mainframe. Why would you need a minicomputer?

You may need a mini for a dedicated application or in a branch that's semi-independent from your parent company or as part of a distributed processing network or maybe in an individual department to take the load off your overloaded system when an upgrade seems too expensive.

Should you be thinking about minicomputers? You bet.

Because it's likely that one day your shop will be given the responsibility to choose one. You have the expertise, management thinks, and so what if you've never even heard of any of the major minis.

Is there a trend within large companies to look at minicomputers for additional processing capabilities? Although most observers say this is not occurring universally now, in the next several years it is thought decentralization or distributed processing will be a real and identifiable trend for larger organizations.

According to International Data Corp. (IDC) in a *Survey of Influential Users of Large-Scale System 370 Computers*, "distributed processing generated far more genuine interest among data processing management than any other interest," but few sites were actually implementing networks.

For the study, distributed processing was defined as the "connection, by means of communication networks, of processing resources that have been distributed to remote locations. Implicit in this definition is the existence of a centralized site from which resources have been distributed and from which some level of control is exercised."

Some large users have implemented application-specific stand-alone systems as separate and autonomous systems, IDC said.

Other large companies have implemented inhouse time-sharing systems on systems separate from the central system complex, IDC said. This trend is expected to accelerate, the study noted.

So whatever your management may decide to do, it's time to think about minicomputers.

Although End-User Support Lacking

Minis No Longer Just for Mini-Sized Businesses

By Stephen J. Callahan
Special to Computerworld

PENNSAUKEN, N.J. – In the past two years the acceptance of minicomputers by the business arena has been on the upswing. Prior to this period, minicomputers were thought to be the special province of the scientific/academic community and the system builder.

The advent of the small business computer and other end-user-oriented products has done much to raise the acceptance level of mini-based systems; however, the real catalyst for change has been the growing interest in distributed processing.

Distributed processing places the control over processing in the hands of the end user. These people needed a system with a defined set of capabilities at an affordable price, and the minicomputer is an obvious choice.

Initially, a minicomputer was acquired to supplement the activities of a medium- to large-scale computer system by offering some local preprocessing capabilities. However, the original charter for minicomputers has been expanded.

There are now some very serious investigations by users into the prospect of replacing their entire mainframe computer system with a group of minis. This is especially true of those companies which can isolate or subdivide their processing activities, with each of the activities implemented on one or more minicomputers.

This specialization gives rise to a need for a communications network – one that connects several minicomputer systems allowing users access to the full range of processing capabilities, hence the distributed processing network.

A New Posture

Not too long ago minicomputer ads featured questions such as "Is your mini system delivered or abandoned?" Now the new, more dignified posture of the mini manufacturers emphasizes their role in the discovery and development of the distributed processing phenomenon. Some of the veteran mini types must find their newly created role quietly amusing.

While it is true minicomputers are essential components of distributed processing and distributed communication networks, minicomputer manufacturers' participation in the development has been more unconscious than conscious.

In many cases the so-called distributed systems were really interconnections of various levels of sensor-based devices and systems for process control applications. So the mini manufacturers' stake in the commercial distributed processing market is in reality represented by a collection of process control-based hardware and software products.

In fact, the credit for much of the cultivation of distributed business applications belongs to the manufacturers of intelligent terminal systems and data entry devices. Their products represent an evolutionary step forward in the ability of users to control their own processing destinies but for many organizations terminal devices served only as an interim step that would lead to a need for greater autonomomy and more power. The minicomputer became the next logical step.

Users are ready, but are the minicomputer manufacturers? The answer is a qualified yes.

The basic problem mini manufacturers must overcome is their attitude toward the user.

The mini companies grew up and were fed by the OEM. This breed of buyer was dollar conscious and sophisticated.

(Continued on Page S/8)

On the Inside

Parts Distributor's Network Nets Inventory Control S/4
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This special report was prepared under the direction of Assistant Editor/Miniworld Esther H. Surden.
Cover art by Cynthia L. Kintzer.

Two Share Data, Files

Real-Time Systems Designed for Order Processing

By Esther Surden
Of the CW Staff

NEW YORK – Two minicomputers at Borden, Inc. International here were designed to make certain the firm's complicated on-line, real-time export order-processing application has little chance of going down, according to Andrew Magrauth, director of management information systems for the company.

The Eclipse C300 systems from Data General Corp. (DG), connected to each other by an interprocessor bus and using a multiprocessor communications adapter, can share data, files and programs, Nachum Bernard added. Bernard is project director and consultant to the project from Delta Resources, Inc.

The major application – and the critical one – is the export order-processing function. "It is almost a text-editing application," Magrauth noted, "because the heading of an invoice contains a considerable amount of information beyond what you would normally find in a domestic kind of invoice.

"Also, in the body of the invoice, there is a lot of miscellaneous information inserted which may be in foreign languages," he added.

The typical invoice contains anywhere from one line on one page to 80 or more pages of 20 lines each, representing a tremendous volume fluctuation, he noted.

Secondary applications not yet on the system will include the replacement of a remote job entry terminal by the minicomputers for batch entry to the company's parent firm's IBM 370 in Columbus, Ohio; the implementation of a CRT-to-disk data entry function to replace card generation; and the use of the minicomputers for word processing.

"Our initial application is to take all the documentation we are generating associated with the development of the system and use a text editor to generate it and print it out," Magrauth said.

Decided Against Turnkey

In designing the configuration, the firm used what it termed the "system development approach," hiring an outside consultant and using "some of our own local people."

The company decided not to use a complete turnkey approach was because of the problem of control. "I wanted to have the capability to maintain the system, since it is a very significant system," Magrauth explained.

The consulting firm was hired to design the system because "we were dealing with new equipment and new software and we wanted to buy the talent that we needed for this startup period. [The consultants] happened to have someone who was particularly well versed in the areas in which we needed help," he added.

The configuration at Borden includes the two 64K Eclipse C300s (shortly to be upgraded to 196K each), two Control Data Corp. 92M-byte disk drives, one 800 bit/sec tape drive switchable between the two CPUs and a 600 line/min printer and a 240 line/min upper and lower case printer for the word-processing applications from Dataproducts, Inc.

The firm is running the CPUs in two partitions each, requiring four system consoles. Two of these are DG consoles and the other two are Hazeltine Modular One terminals.

In addition, the company has 14 more Hazeltine CRTs.

The total hardware configuration represents a $300,000 investment, Magrauth said.

Switching in Failures

Deciding the order-processing application was "absolutely critical," Borden looked into the "hot spare" approach, but Magrauth said "that approach gets very, very expensive."

The company thought the same degree of backup could be accomplished by having dual machines, with one tied to the critical application and one used for the remaining applications.

Because of the way the system was implemented, "if we have a CPU malfunction, we'll switch everything else down soft and bring the order processing over to the other CPU, or alternatively run everything in a degraded mode on the other CPU," Magrauth said.

"The system was also designed so we can lose up to two dissimilar peripherals and still run," he added. For example, he explained, a disk and a printer can go down and, although the system will be slowed, the orders can still be processed.

Although the firm envisioned running in parallel with Singer machines that were formerly processing the order entry application, the lack of Singer support for the machines made that impossible, Magrauth said. So the company began shifting geographical segments of the application to the DG machines without running in parallel and it "worked surprisingly well."

Software development was a joint effort between Delta Resources and Borden, Magrauth noted.

"The software is constructed in such a way that there is only one adapter for each CPU. When we bootstrap the aystem in the morning, we are able to boot from device one for one CPU or device zero from the other CPU and by so doing divorce the systems," Bernard said.

"All of the data can be transmitted from one computer to another, but as far as the utilization of resources, there is no interference between the on-line system and the program development system," he noted.

Users Pleased

The system's users have been very responsive and pleased, Magrauth said, adding that working with the system has now "almost become a status symbol although there was some initial apprehension.

"The operators have found they have total control over the system," he added, and the sales department is using it to check on order status.

During the implementation of the minicomputer system, the company did have some disturbing DG hardware difficulties; these were cleared up after the first two months. The disk controller boards were bad, Magrauth said, and the company went through about 20 of them before the problem was finally corrected.

The hardware from such firms as Dataproducts and CDC has been extremely reliable, however, he noted.

The company had estimated a 50% to 100% increase in processing ability with the system over the former method, but that seems to have been a conservative estimate, Magrauth said. The efficiencies resulting in using an on-line system were underestimated and the true figures should be about 200% to 300%, he explained.

Divorced From Mainframe

First Commitment to Minis Made With Care

NEW YORK – How does a division of a large company go about making its first commitment to minicomputers a strong and lasting relationship?

Very carefully, according to Borden, Inc. International.

"We'd been married to the big mainframe manufacturers and we hadn't been doing anything with on-line, real-time applications," according to Andrew Magrauth, director of management information systems for the company.

The firm has two 370/158s located in the Borden, Inc. corporate headquarters data center in Columbus, Ohio, "but although they are running major applications there, they are not using the kind of DP approach we were planning on implementing here in New York," Magrauth said.

The application in New York, he explained, was to be completely developed and supported locally. The company was planning an export order-processing application tied in with stock allocation, credit control, printing of invoices and accounts receivable – all connected to some existing sales applications.

The company spent about 6 man-months specifically defining what was needed. "Very early in the game we knew we wanted an interactive application, so that helped us define where we were going, but we even defined report layouts and screen layouts," Magrauth said. While the requirements were well-defined they were not tied to a certain machine, he emphasized.

When that preliminary stage was completed and approved, the firm took a look at the available hardware. "It appeared certain equipment in the IBM line should be given some consideration," Magrauth said, "and we looked at an IBM 370/135, the Digital Equipment Corp. PDP-11/70 series, the General Automation [GA] 440, Hewlett-Packard equipment and Data General [DG] minis."

A request for proposals was then put together, and all those vendors but Hewlett-Packard responded with bids and formal presentations. "We went out and visited the manfuacturers and made a final selection based on price, performance, the hardware considerations and the software," Magrauth recalled.

The next step in the selection process included a weighing of the various factors involved for each piece of equipment:

- Systema factors were examined. These included cost, reliability, expandability, independent equipment support and support for remote job entry and data communications.
- Software factors included the suitability of the operating system, the structure and performance of the application language, file management software, sorting capability, data security, operating interface commands and job independence.
- Hardware factors looked at included processor performance expectations, product life cycle positions, product stability and peripheral performance expectations.
- Vendor factors included the stability of the firm, local support and technical capabilities, service capabilities and a commitment to develop ANS Cobol.

Although Borden International is not writing programs in ANS Cobol, it wanted that option as a possibility for the future, Magrauth explained.

Each of the criteria was given a value and then each system was rated accordingly to come up with a matrix. "This got us away from the temptation of dealing with a salesman who could be a nice guy," Magrauth noted.

The selection came down to GA and DG, he continued, and company stability along with software were the deciding factors. "The GA organization at that time seemed to be going through too much a a shake-up," he said.

In addition, "we were particularly impressed with DG's operating software and the Infos file structure capability, and that has turned out to be a very, very good decision on our part," he said.

With the selection process over, the company launched the systems development phase . . . but that's another story.

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Based on 'Flock of Minis'

Parts Distributor's Network Nets Inventory Control

By Mal Stiefel
Special to Computerworld

MEMPHIS, Tenn. – Automotive Distributor Parts, Inc., headquartered here, is capping 10 years of sustained growth and data processing systems development with a multifaceted distributed inventory control system, based on a flock of Data General Corp. Novas supporting a Honeywell 66 series mainframe.

The latest iteration in the life of the system, called Tops III, is a hierarchical network, anchored in Memphis, reaching from Sacramento, Calif., to Taunton, Mass.

The system, currently undergoing tests, is expected to provide comprehensive inventory control services to Parts, Inc. (PI) and to several other auto parts distributors around the country by the end of 1977, according to the company president, Dunbar Abston Jr.

Tops III, being developed by Memphis-based Data Communications Corp. (DCC), is also designed to permit automatic order entry for replenishment of stock by more than 300 jobbers who are PI customers. The system will also furnish basic accounting services to the jobbers, Abston said.

The current system, Tops II, installed in 1974, doesn't support the jobbers. Order entry at present is accomplished by telephone calls from the jobbers to PI warehouses.

The Nova 2/10s are used in Tops II, but they only act as switches routing data from the Applied Digital/Data Systems, Inc. (Adds) CRTs to the mainframe in a polled batch configuration.

In Tops III, the minis will have a more active role, capturing and validating data, using on-line files refreshed daily by the mainframe, Abston said. The CRTs will be controlled locally by the Novas, removing much of the load from the mainframe, he added.

Dedicated Subnetworks

In Tops III, each major user of the system will have a dedicated subnetwork controlled by a Nova. In the case of PI itself and other larger users, the subnetwork will also include secondary Nova-based control stations at various warehouses.

There are eight users in the systems right now, in addition to PI. Six other distributors have made commitments to join the network when Tops III is implemented, Abston said.

Each master Tops III master control station will include 32K 16-bit words of core, a 20M-byte disk, one 120 char./sec Centronix printer tp handle rush orders, a Data 100 Corp. 300 line/min printer for nonpriority work and a Teletype ASR 33 serving as an operator console.

Each master station will have a 32-terminal capacity, although no more than eight CRTs will be tied to any given master directly, Abston said.

Secondary stations, carried by the larger users, will operate under control of the masters. The secondary units will have 16K words of core, no disk and two Centronix printers.

Local asynchronous CRT-to-CPU traffic will be carried at 9,600 bit/sec, while the CPU-to-CPU net will operate at 4,800 bit/sec, using Milgo modems and Data General Corp.'s communication chassis hardware.

The network will use synchronous communication techniques, based on Honeywell's VIP line protocol.

Logical Vs Physical Net

A DCC spokesman explained that the logical network may not have a one-to-one correspondence with the physical network for each user. In some cases, secondary station transmission will be routed through the mainframe in Memphis to the master to minimize line charges, depending on the station locations. In other cases, the secondary and master stations will communicate directly.

In either case, the logical network will be the same. Logically, each secondary station will be controlled by the master, no matter how the physical network is set up.

For PI and the other major users, Tops III will provide accounts receivable and payable processing, general ledger, inventory management, sales and profitability analysis; payroll will be run for PI itself, but not for any of the others.

Jobber Net 'Most Exciting'

One of the "most exciting things" to be realized in Tops III will be the extension of the network to the jobbers, Abston said.

Each jobber will be given an ADDS System 70 floppy disk terminal tied directly to the Honeywell mainframe for on-line order entry and inquiry over a dial-up network. The CPU will pool each terminal at night to capture the day's transactions. The on-line entry capability during the day will be used for rush orders. The routine traffic will flow when the polling takes place at night.

The jobbers will enter sales data. From this information, the CPU will compute stock replenishment orders, eliminating the need for a separate ordering function except in extraordinary circumstances.

The system will also provide accounting functions, sales analysis, and profitability analysis to the jobbers, although it won't support the jobber billing function, Abston added.

Tops II, the current system, was built in a relatively short time to allow replacement of Honeywell 7700 terminals in warehouse locations and to eliminate Honeywell Keytape units. The Novas were brought in to emulate 7700 terminals, so the changeover was invisible to the CPU.

The original Tops II mainframe was a Honeywell 2000. The Honeywell 66 was brought in as the first step in Tops III, to improve system response time and to incorporate a warm restart capability. Abston emphasized that the 2000s were a "super family of computers," but not designed for an on-line environment.

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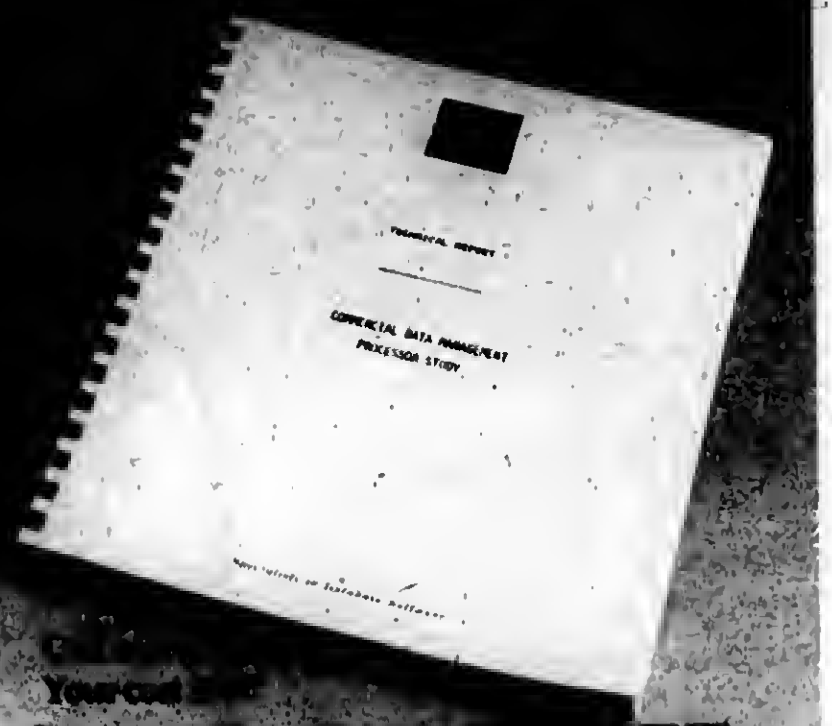

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CALCOMP

Without Programming Staff

Manufacturing Mini Gives Hughes 'More Control'

By Esther Surden
Of the CW Staff

CARLSBAD, Calif. – A division of a large firm here found a dedicated minicomputer was the best way to go to achieve more effective control of its manufacturing operation.

The Industrial Products Division of Hughes Aircraft Co. considered both time-sharing and batch-oriented systems and decided a dedicated minicomputer could best do the job, according to Jack McNamee, data processing manager.

"We had determined what our needs were, interviewed all of the nationally known computer hardware vendors and did quite a weighing between the cost of buying and that of renting or leasing.

"I guess what it really boiled down to was: What could we get that would serve our purposes for the least amount of money?" McNamee said.

"Although my title is director of data processing, my background is in manufacturing," McNamee noted. The division wanted a system that would not require a programming staff.

Challenge to Vendors

"The wheel had already been invented and we knew it had been invented and we also did not want to go with a batch-type system. We wanted an on-line system, and very few of the vendors accepted our challenge."

The "challenge" to supply both hardware and software for an on-line manufacturing management system was met by Hewlett-Packard Co. (HP) in conjunction with ASK Computer Services, Inc.'s Manman software package.

The software provides inventory control, keeps track of all purchase orders and all processes on the assembly line. But history such as this does little good unless it can tell something about the future as well, McNamee said. So the system maintains order demand files, files of spares on hand and forecasts and comes up with a material requirements planning system. This tells what the future demands will be, what order they will come in, what should be sold and what will be needed for spares in stock.

"When we run that program, it looks at the quantities we are after in our bill of materials, looks at the stock, purchase orders and work in process and then comes back and tells us what we have to buy, when we have to buy it, when it should be in the stockroom and when we can ship to the customer," he continued.

The system keeps inventory in an "as-needed" state, without it running too high or too low and gives the firm the visibility into the inventory that wasn't available before, McNamee said.

The configuration at the company includes an HP 21MX with 32K words of memory, a 1,600 char./in. tape drive, 15M-byte disks and a 200 line/min printer.

The company also has four CRTs located in the stockroom, receiving, production control and purchasing departments. The hardware and Manman software together cost the firm about $150,000, he noted.

Pleased With Support

Melba Brookbank works on a Hewlett-Packard system at Hughes Aircraft Co.

The system, which has been operating since March, has proved to be very reliable, and McNamee is very satisfied with the support from both the minicomputer maker and the software vendor.

The mini hasn't been down for any unacceptable length of time. As an example of the software support, McNamee said, "We had several requests for changes on reports that were rather urgent because we were approaching the end of the fiscal year, and we needed to change a format or something on the report." He called ASK in the morning and by afternoon some personnel had flown in from San Francsico. The changes were done by the next morning, he said.

The primary benefits from the system have come in manpower savings, he noted. "We haven't had it on the air enough to be able to appreciate a change in inventory levels yet," he said.

Previously everything was done manually, he noted.

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Whither Minis? The Micro/Mainframe Squeeze Is On

By Jean Bartik
Special to Computerworld

OCEANPORT, N.J. – After six years of growth in the use of their output, minicomputer manufacturers are at the crossroads.

Many right decisions need to be made if a manufacturer is to continue increasing gross sales at a 25% clip.

Minicomputers are surrounded. Microcomputers are to the left of them and mainframes to the right. Minicomputers are now caught in the middle. Where do they go from here?

The decisions that will be made will inevitably affect the minicomputer user.

Minicomputers no longer offer the cheapest hardware; they never offered the easiest solution to user programs. A minicomputer user needs to be knowledgeable about computers as well as his application.

Up to now, the minicomputer manufacturers have expanded markets both up and down. They have produced smaller, faster, cheaper models for the low end of the market and bigger, more powerful and more expensive models at the top end.

The top-end models from most minicomputer manufacturers can compete on straight hardware performance with the IBM 370/158. The low-end models compete with the Intel 8080 microcomputers.

The top minicomputer models, however, cannot compete across the board with the IBM 370/158 because minicomputer manufacturers do not provide the same support as IBM. Markets must be selected where users do not require the support only an IBM can provide.

The low-end minicomputer models can compete with end-user microcomputer systems, but not with the volume OEM microcomputer. The price of the logic on the microprocessor chip is so low only a semiconductor house can afford to produce it.

Some Big Questions

Right now, the management of each minicomputer company must answer some big questions. The answers to these questions will affect what users can expect from each company in the years ahead. The answers require long-term commitment in development and dollars.

- To succeed, must a minicomputer manufacturer develop an in-house semiconductor facility?

This is a hard question to answer, and it is being argued at many management levels throughout the minicomputer industry.

Developing a semiconductor facility requires an expensive, long-term commitment. It will tie down a company's development team so it can't pursue other development projects.

Most minicomputer manufacturers will buy a facility already in production. To develop a microcomputer chip for an established minicomputer line takes about three years and a minimum of $2 million or $3 million.

Production volumes for minicomputers are low in comparison with efficient semiconductor capacity. Recouping that large investment from traditional minicomputer markets is impossible.

Markets must be expanded so tens and hundreds of thousands of units are sold each year.

The biggest advantage a microcomputer emulating an established minicomputer line has over a general-purpose microcomputer developed by a semiconductor house is the software available to run it. For applications requiring minimal software, that advantage disappears.

Computer people, traumatized by the horrendous software problems the industry has had, intuitively believe a pile of software is an asset. But is it?

It is important to an end user who expects a microcomputer to behave like a minicomputer. To a less demanding user who requires little of the microcomputer's intelligence and will waste most of it, software has little meaning.

- To succeed, must a minicomputer manufactuer develop comprehensive networking software?

With the current move toward distributed processing, all the mainframes and some of the minicomputer manufacturers are developing comprehensive networking software. Is it necessary for success? Does distributed processing mean networking per se?

Developing comprehensive networking software, like developing an in-house semiconductor facility, requires a long-term commitment. Software development time is about five years. Cost will vary depending on the number of systems for which software must be developed, but it will run into the millions of dollars.

Computer networking is in its infancy and growing rapidly. Certainly, many networks will be set up. Distributed processing, however, does not necessarily mean networking. Many applications can be offloaded from a central site and handled completely by minicomputers. Or a new application can be implemented using a mini without ever becoming involved with a central computer facility or other computers.

Certainly all minicomputers need a variety of data communications facilities to communicate in standard ways with other computers. Data communications software, however, is less complex than full-blown networking facilities.

Network software must be complex to allow a manufacturer's computers to perform the roles of host, node or terminal in a network: to maintain control, to route messages, to recover from errors, to decide what to do when parts of the network go down and to maintain service.

Also, networks have problems that may inhibit their widespread use. One is the problem of overall network security and the other is overall network control.

Perhaps a minicomputer manufacturer might be better off developing software so its computers can emulate popular terminals and make its major investment in special applications software.

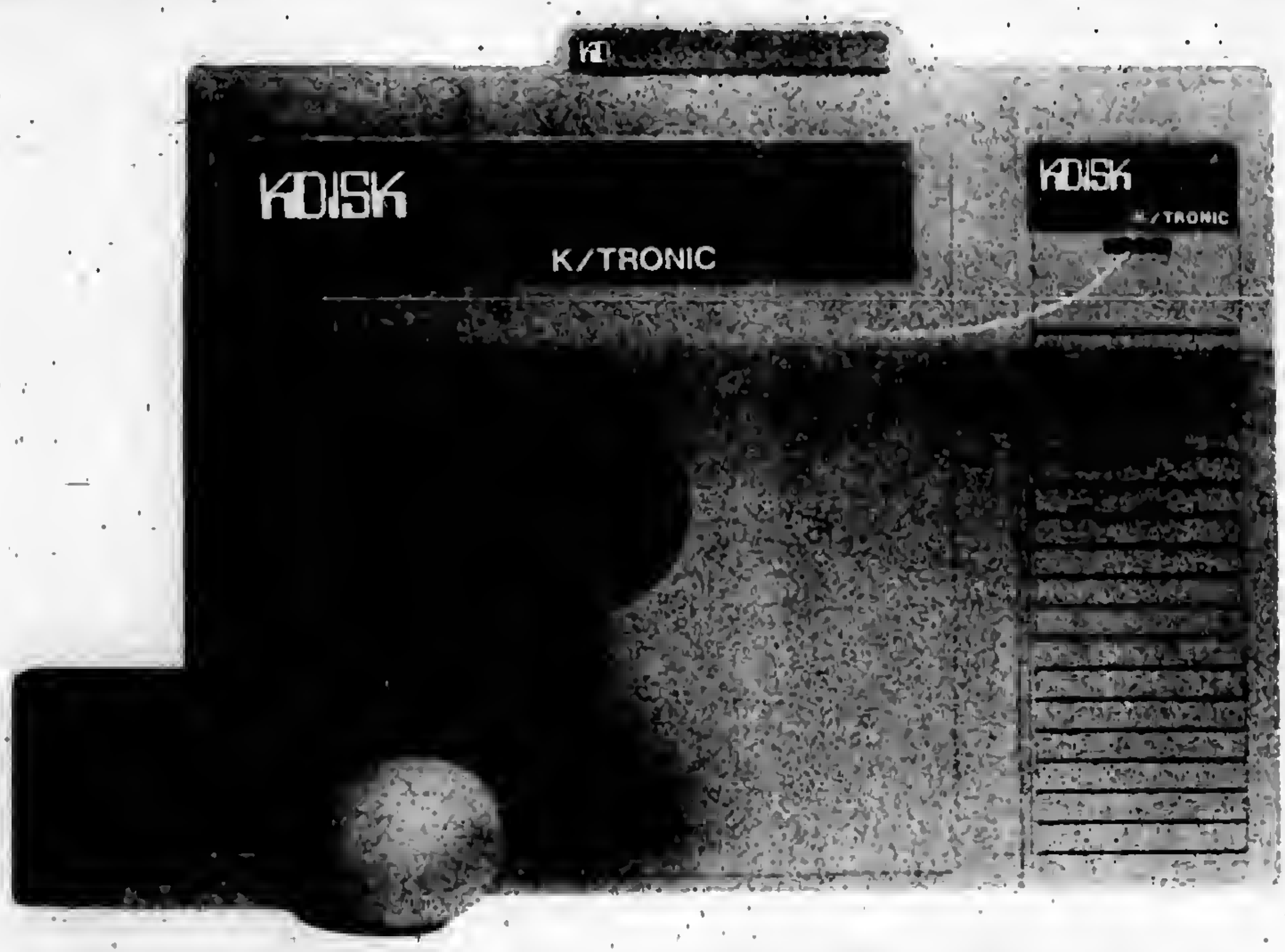
Commercial Market

To succeed, must a minicomputer manufacturer pursue the commercial market?

Most minicomputer experts generally agree minicomputer manufacturers cannot maintain their 25% per year growth rate without going commercial. The commercial market is so broad that answering "yes" to this question is meaningless. Which commercial markets? Where? How?

Most people divide the commercial market into functional markets without re-

(Continued on Page S/18)



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Minicomputers Now Province of Commercial Firms

(Continued from Page S/2)

He bought a mini to meet a strict set of technical specifications, modified the operating system, supplied his application software and was generally never heard from until the next buy.

This kind of self-sustained customer has left the mini maker with a poor sense, of what is meant by true end-user support. So far, in their pursuit of the end user, minicomputer manufacturers have learned to dress up their advertising and create snappy marketing terms to describe their distributed processing offerings.

However, they have a long way to go in understanding what is meant by full end-user support.

If the mini manufacturers are slow learners, they may become eclipsed by another market supplier, the medium to large computer mainframe manufacturer.

This group is beginning to embark on a new learning curve – the one that teaches one to think small.

Already there are rumors and test marketing of minicomputers by the major mainframes who know what is meant by full support, but lack a sense of scale. To date, they have tended to overbuild for the mini market.

So there is a deadly serious horse race between the traditional mini makers and the mainframers-turned-mini-manufacturers. The group which gets over its learning disability first will, in all likelihood, claim the lion's share of the distributed mini market.

In the meantime, users implementing distributed processing networks are caught between a rock and a hard place. Should they get started with a mini manufacturer who does not fully recognize their needs or wait until the majors get their product line ready for the market?

With spirit of adventure, users are going ahead, however imperfectly, in a partnership with a mini manufacturer. The mini manufacturers show evidence of willingness to work with and learn about this demanding, but potentially powerful, new class of customer, the end user.

The investment by the mini manufacturers will pay handsome rewards in the future. The name of the game in distributed processing networks is experience.

As the mini companies continue to tally more networking experience, they are putting more distance between themselves and the majors.

Callahan is a managing editor at Auerbach Publishers, Inc., 6560 N. Park Drive, Pennsauken, N.J. 08109. This article is extracted from Auerbach Distributed Systems, *an updated information service.*

Network of Minis Eases Operation And Reduces Cost

(Continued from Page S/12)

4,800 bit/sec dial net lines Ford has for all its applications, he added. In some cities, where the traffic on the lines is too heavy, the firm plans to change to dedicated lines.

Sales Reports Applications

Although 90% of the activity on the minis is dedicated to this application, the minicomputers are also used for sales reports. This is because "the depots are sitting next to our sales offices," Santoni said. Tractor sales status reports are sent to the salespeople in the field to tell them, for example, if a particular tractor has been placed at the plant for production, or if it is scheduled for production for a particular day. The parts people walk the reports over to the sales department, Santoni noted.

The central system is used "primarily to process all the data that comes in and keep track of how the small depots must be replenished from suppliers or from the larger depots."

The central system also does all the accounting and invoicing for the transactions centrally. Prior to the new network, the accounting function was decentralized. The company has realized a cost savings by removing the accounting people from the depots, he said.

A primary benefit of the Burroughs network is it has smoothed out a rough work day at the central facility. Under the 3s, Santoni explained, each depot operated all during the day until about 1:30 p.m.

Then the depots would know the parts they could not fill because they lacked the inventory. A report of the needed parts was fired off to Detroit because Detroit has the largest inventory.

Then the "Detroit depot would scurry from about 2:30 till quitting time to get the stuff out."

Now at 9 a.m., when the depots get the first batch in, the main depot knows about the needed part by 10 a.m., and so on through the day.

The communications programming was performed by Burroughs while Ford did the applications programming. Santoni estimated programming took Ford and Burroughs each three man-years of investment.

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IBM 3s Linked to 370

Distributed Network Increases Agrico's Cash Flow

Special to Computerworld

TULSA, Okla. – A large agricultural concern's distributed network of minicomputers linked to the company's mainframe here has allowed "greater profit potential through increased cash flow," according to Henry T. McCarley, general manager of retail sales for Agrico Chemical Co.

Roger Mayer's Farm Center looks to the minicomputer-based service of Agrico in Tulsa, Okla., for the information needed to help keep businesses operating at a profit with a high level of customer service.

Roger Mayer is one of 80 Agrico employees operating farm centers in communities across the country. Each center is linked to the corporate headquarters through a distributive network of regional IBM 3s and an IBM 370/158 in Tulsa.

Agrico is a subsidiary of the Williams Companies. It produces, distributes and markets fertilizer products.

Agrico has installed a Retail Marketing System around 3/10s in each of its three retail sales division headquarters. These systems, through 3741 data entry units, communicate with the 370 in the Williams data center.

Division offices are located in Saginaw, Mich.; Wilmington, Del.; and Henderson, Ky. The Haubstadt Farm Center is one of 34 that report to the Henderson office. Each serves from 50 to 400 customers.

"Each center manager gets a monthly income statement showing exact profit and loss," McCarley said.

"The manager is the source for all information flowing through the system, a businessman as well as a knowledgeable farmer."

The system meets the central needs of a retail organization, McCarley said. "We're a business within a corporation, and we can reflect that with our computer network. I've talked to a lot of people in this industry, and so far I haven't found a company that relates to profitability by facility like we do."

Each manager is responsible for submitting a variety of daily information to the division offices, including invoices, inventory adjustment forms, accounts payable and receivable, asset adjustment forms and payroll.

This information is entered into the Model 10 at the division office and recorded on IBM diskettes capable of holding the equivalent of 250 invoices each, McCarley said.

An entire day's business can be transmitted over telephone lines from regional offices to Tulsa in eight minutes. Once received in Tulsa, the data is processed on the Model 158, which generates reports for use by divisional offices and farm center managers. The reports are back in management's hands the next day, he noted.

"This distributive method of data processing has real advantages for the manager, while enabling corporate management to see what's happening on a day-to-day basis at remote locations," McCarley said.

"The distributive system works great when you consider that our people in 80 remote farm centers need to know what's going on in their operation, yet can't spend time attempting to analyze hundreds of documents. There wouldn't be time to run the business and compile reports too. Now we get answers at both ends in a very short span.

"With this system, we've minimized errors, increased the speed of reporting for profit and loss purposes and have given our farm centers a greater profit potential through increased cash flow."

"This is a seasonal business," Mayer said. "Information from the reports is crucial particularly, during the busy seasons in April, May and June. Our customer statements help me answer any questions my clients may have.

"The sales analysis report provides me with a gauge of what products are moving and when. That's important, because we're dealing with a business that doesn't operate on an even keel 12 months of the year."

The benefits go both ways. McCarley uses a weekly sales analysis report in Tulsa.

"When I see something that isn't moving, I can pick up the phone and find out why. The system is geared to show the profitability of all our products. Management here and at the centers places emphasis on selling the most profitable lines. If we didn't, it would show up on our reports.

"The system complemented our way of doing business. We built it around the business, not the other way around."

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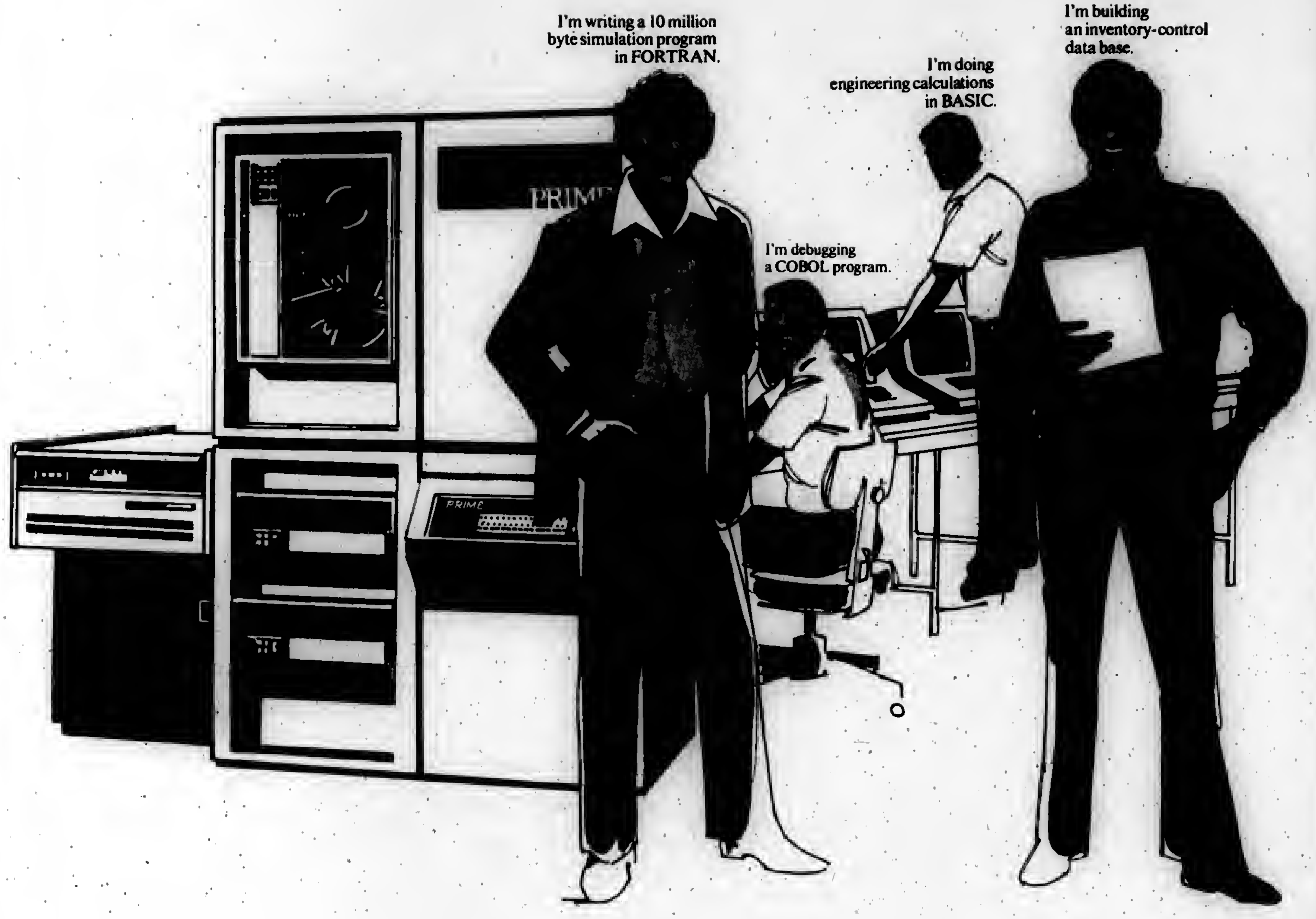
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PR1ME

Applications, Not Hardware, Key to Mini Successes

By Dr. Heinz Dinter
Special to Computerworld

In the past, if the prudent businessman didn't stop cold in his shoes upon studying a proposal from a computer vendor because of the high cost of a system he earned himself the admiration of his stockholders.

And if he was able to discover that the computer's purchase price was only the tip of the iceberg, he earned their respect.

Total DP costs can go straight through the ceiling when one adds the costs for the programmers and operators.

The businessman certainly earned himself a medal if he was able to foresee all costs associated with malfunction, misfunction and nonfunction of complex machinery which couldn't be handled because properly qualified people could not do the job right.

The days of price tags for computer equipment with full systems power exclusively in the $200,000-plus price range are gone forever.

The minicomputer has made it possible for the prudent businessman to purchase a system with a full complement of peripherals for less than $100,000. Evidence also abounds to prove that these machines work very well and are highly reliable.

Unfortunately, however, the technology which has brought us the minicomputer has yet to find a cure for the major ill of a business operation: the implementation of computer programs and application systems to get the job done.

The system must print paychecks, control inventory levels and report whether a profit has been made by the business enterprise at the end of the year. Management control over the DP operation has become more manageable with the mini as well.

Tip of the Iceberg

The minicomputer costing $75,000 can do the work of a small computer system offered by well known major manufacturers costing as much as $225,000 with fancy sales brochures galore and mountains of pretty manuals thrown in to boot.

Gee, what a bargain! Beware!

And beware for the same reasons that those who cannot see below the tip of the iceberg have been badly misled by the biggies and their biggie machines. No computer will do its job and produce an invoice unless there are good people who can make the machine produce good results.

However, the fact that a minicomputer may cost one-third that of a big brother's machine does in no way mean the cost and effort of software development is also two-thirds less. Frankly, the problem with a mini may be even somewhat more complex if one is able to overlook the fact that a $75,000 computer is not doing its job It is not as bad as when a $200,000 computer is sitting collecting dust.

Minicomputer manufacturers bend the meaning of the word "ethics" to the utmost limit if they tell you they see no reason why the accounts receivable system can't be up and running in no time.

Despair not yet. There is a way to reap the benefits of the minicomputer technology. Those benefits come from companies which specialize in turnkey systems.

The businessman in need of sufficient computing power can go to such an organization and draw a contract which will include the purchase and maintenance of the hardware, the development and implementation of application systems and the continued support for those applications systems.

If there are any elements the systems house is unwilling or unable to provide, then you should stay away.

Inasmuch as minicomputers and related services are more easily obtainable than an end zone ticket for the Pro Bowl, it is by no means clear how you, as an inexperienced purchaser of computer equipment and services, can effectively evaluate proposals which could flood your desk.

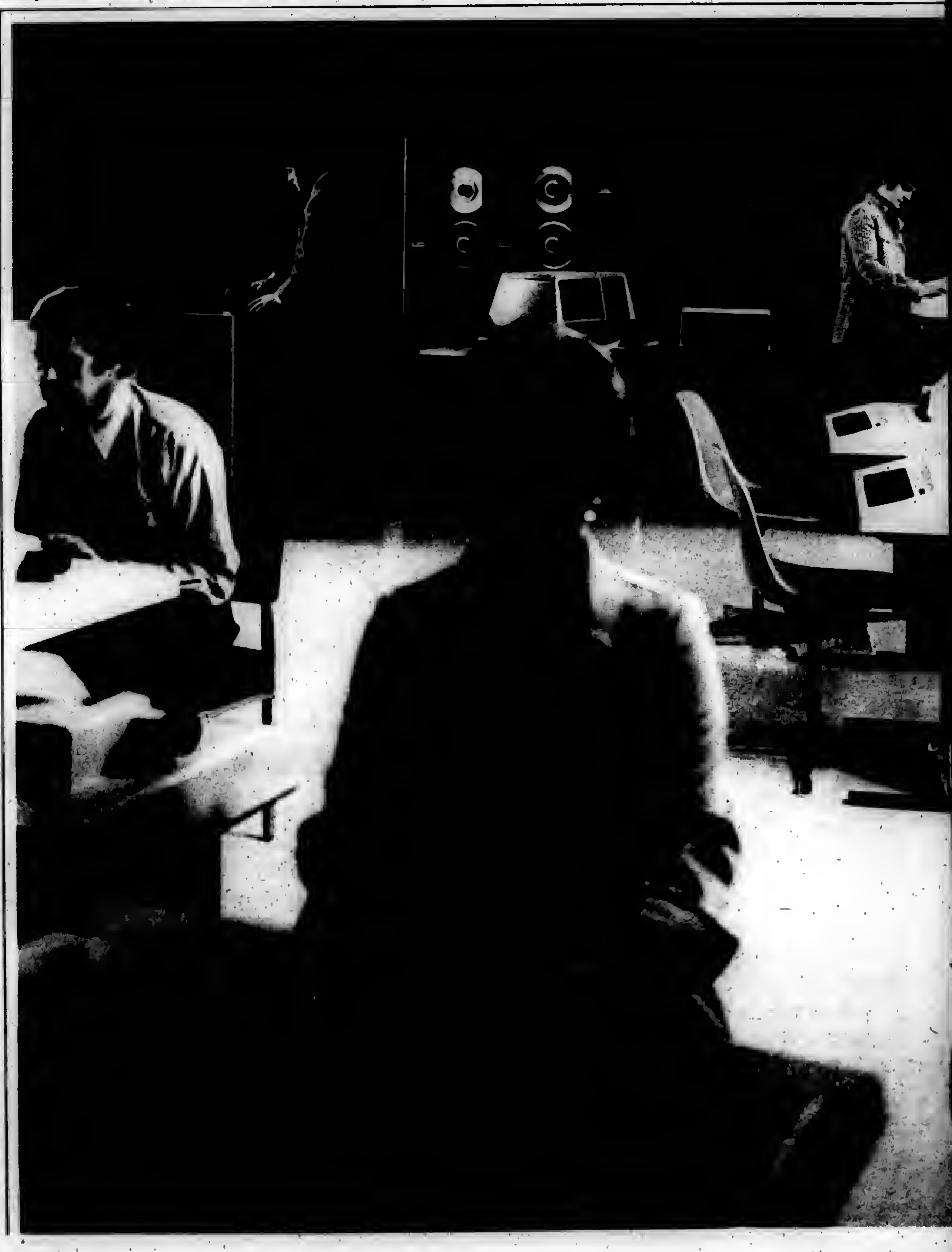
Lay one simple ground rule: accept no promise, unless and until It is in writing.

To evaluate the written proposal, take it one step at a time. First, evaluate the performance and what that vendor's machines and services will do for you. You can go to a customer of that vendor and scrutinize how the equipment and programs work there. Don't take the easy way out by simply placing a phone call.

After you have ascertained this is the system that will cut the mustard, you should then ask the all-important question: How much?

Now you must make another basic decision: analyze all costs on the basis of at least five years. Anyone comparing DP costs strictly on the basis of the figures in a proposal, which could identify cost from anywhere between one month prior to installation until no more than six months following installation of the equipment ordered,

(Continued on Page S/20)



Especially in Networks

Software/Hardware Ratio High in Mini Systems

By Lynn Mason
Special to Computerworld

The acceptance and broad application of minicomputers has been followed closely by the implementation of distributed data processing networks.

One important factor contributing to the widespread use of networks has been their cost effectiveness. In an effort to enhance the cost effectiveness, designers of mini networks sometimes take shortcuts in software development.

Shortcuts are taken because users expect the ratio of software development costs to hardware costs to be the same for minicomputers as it is for big systems.

The reality of the situation, however, is that the software development/hardware cost ratio is likely to be much higher for minicomputers.

The majority of dispersed data processing networks are successful. The few networks that fail have one or more of three traits in common:

- Control is minimal or not present at all.
- Edits are insufficient.
- The design of the data base is such that it will grow only to a certain level. The growth level is usually determined by the storage capacity of the system.

Only one of these factors needs to be present to jeopardize the usefulness of the dispersed data processing network.

Designers who bypass controls usually consider them to be useful only for verification of the completeness of a "batch" of data. Since distributed networks are on-line and data entry is performed by the persons directly responsible for the data, controls are often considered unnecessary.

With distributed networks, however, controls are of the utmost importance. An incomplete data set may go undetected until someone complains, "We submitted that invoice two months ago. Where is the check?"

Complaints of this nature do nothing to better a company's image and do even less for a system's credibility.

The approach to control of a network should be the same as the technique used for control of more conventional systems. Controls in networks are no more difficult to utilize and should be a high priority function.

Edits are usually a different story. They are usually present, but only in a cursory fashion. In an order entry system, the customer number and part number may be verified, but the unit price is assumed to be correct.

An order acknowledgement may be sent out with a $10 price tag on a $100 unit. When the salesperson discovers that one, the old credibility gap will widen again.

The ability to complete edits is partially dependent on the capabilities of the hardware. If it costs extra to do thorough edits, the price should be paid.

Effective edits and controls are not that expensive, but in a cost crunch they will probably be the first thing to be trimmed. Why reduce them in the first place? If the network is to be successful, they will be added later.

Data Base Considerations

While controls and edits are critical to the day-to-day operation of a network, the data base design is important to the long-term success of the application.

Many data bases have a limited growth cycle because of restrictions inherent in their design.

Going back to our order entry system, the design may require that the entire customer data base be present for operation of the system. A more sound approach might be to design the system so it would operate with only a portion of the customer master on a single system.

As the customer base grows, additional hardware systems could be added to alleviate capacity problems. The processing could then be done, for example, on a regional basis.

In the heyday of the large mainframe, DP practitioners depended on the vendors to develop larger and larger machine capacity. Can we depend on mini vendors to expand capacity on a continuing basis? Can we expect them to do it at exactly the right time?

Distributed data processing networks are a valuable tool to business when properly designed. They usually cover a large geographical area.

However, it is more difficult to correct errors in a network and it is more difficult to determine completeness of data sets. Good edits and controls will save many hours of grief for the designer and the user and these steps are well developed and easy to adapt.

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'People-Driven' System Involves Non-DPers in Net

NASHVILLE, Tenn. – A retailing organization here calls its distributed processing net using minicomputers a "people-driven" operation.

Service Merchandise Co. has made a real effort to involve noncomputer professionals in DP, putting a major portion of the performance burden at the local level, according to Roger Lancina, special projects manager.

This was not always the case. Previously, one minicomputer connected to a host computer served the firm, which runs catalog showrooms in about 11 states [CW, Dec. 24].

However, the emphasis has changed, and now the $200 million firm has installed 11 Micos minicomputer systems from Minicomputer Systems, Inc. in its showrooms and expects to have 17 more stores equipped with the Data General Corp. Nova-based systems by the end of the year. The stores are scattered over the Southeast and Midwest, Lancina said.

"Shifting the responsibility to the showrooms has accomplished two goals," Lancina said. "First, it gives the showroom manager a real voice in operations, rather than being a simple-minded 'slave' to the host computer, which is typically the case.

"We think this is important because each outlet is a good-sized, dynamic business of its own and the people running it have to be strong.

"Second, a computer in the retail location permits the host computer to act with great confidence in servicing that location and the entire chain."

Up to 24 CRTs can be connected per showroom in the computer configuration. Eighteen of these are available for cash registers, and the others are placed at various key points in the showroom and its contiguous warehouse.

Orders are taken at the cashier-operatored CRT stations, where the local computer is queried as to the availability of an item in the warehouse. This triggers the process of securing the product for delivery to the customer on the spot and the updating of inventory data.

Every night, a system in Nashville, also a Micos mini, polls each showroom system in turn, taking about 15 minutes to secure the details of every transaction at every register. These detailed reports, which include coded inventory numbers, are then processed by the host Honeywell 2060.

The host can update inventories of the central warehouse here, determine what goods to ship to specific showrooms, decide what goods should be reordered from suppliers and what orders might be delayed or canceled and make other similar decisions.

The nightly reports also provide a financial picture, including the cash situation at each showroom and credit card company billing data.

The Nashville system also transmits file update data to the various showrooms, most typically on price changes, new items and discontinued items.

The network development took place under actual conditions, with particular emphasis on a complete cash and inventory control mechanism, Lancina said.

This upgraded system was installed in three Georgia showrooms early this year, where personnel were encouraged to make suggestions, pick out errors and not stand on ceremony with the DP professionals from Nashville. They did just that and "helped immeasurably in the refining and completing of the product," according to Lancina.

Portable Mini Relieves 370 Of Batch Work

INDIANAPOLIS – A portable system here is taking the heat off of Stokely-Van Camp, Inc.'s IBM 370 downstairs.

The IBM 5100 is being used in the financial and budget departments at the fruit and vegetable packaging firm to handle a variety of applications not available from the batch system, according to J. Ronald Summers, corporate director of budgets.

The system performs volume price and cost analyses for the firm's divisions.

"Basically, we're now able to handle a variety of financial and budgetary projects so time-consuming they would be prohibitive to do by hand," Summers said. "And for us they are not feasible to do on our larger computer." The computing power can now be given to the individuals who need it, he added.

The system with 32K of memory, a printer and an auxiliary tape drive cost the firm $20,600. It is being used by the tax department to explore various trading strategies in the soybean oil futures market and to calculate outlays for capital investments, he said.

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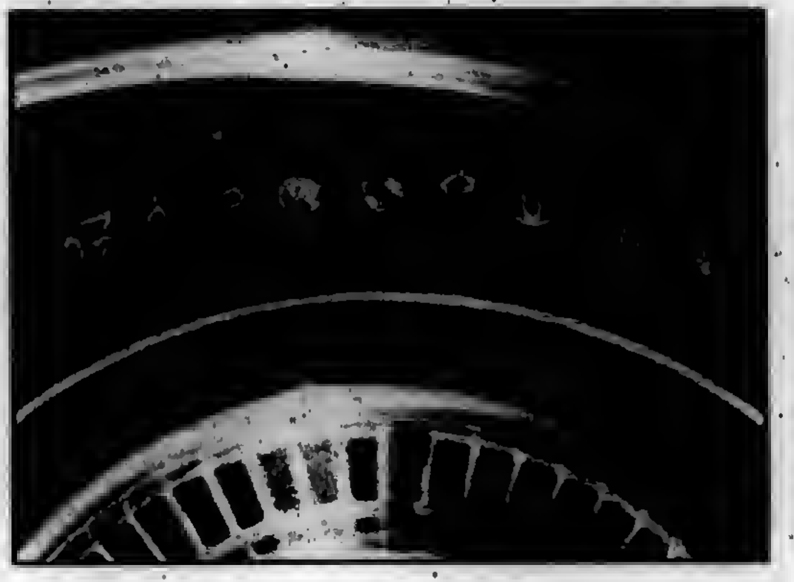

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Brooks Hall/Civic Auditorium, San Francisco

Conference Program

Tuesday 9:30 - 12:00

1. LSI MEMORY

Semiconductor memory technology is having a dramatic effect on user software design decisions and overall system costs. This session will address those effects.

Organizer: Dan M. Bowers
Mini/Micro Systems

2. MICROCOMPUTERS

A tutorial session designed to get managers and neophyte designers acquainted with the microcomputer revolution.

Organizer: Manny Lemas
Microcomputer Assoc.

3. MINICOMPUTERS

A tutorial session designed to acquaint users, managers, and neophyte systems designers with minicomputers.

Organizer: Tom Sherrard
General Automation

4. PRINTERS

This session will address line printer selection, criteria, maintenance, use and the major differences in line printer technologies.

Organizer: Don Bowman
Hewlett-Packard

Tuesday 1:30 - 4:30

5. MEMORY PERIPHERALS

Mass memory peripheral advances will have significant influence on the direction of future system designs. This session will address their advances and the issues which users face.

Organizer: Bill Frank
Pertec

6. MICROCOMPUTER SELECTION CRITERIA

Any potential user of microcomputers faces the decision of whether to build a special system from chips or use a packaged microcomputer. This session will help users make that tradeoff.

Organizer: Robert Van Naarden
Digital Equipment Corp.

7. ADVANCED MICROCOMPUTER FUNCTIONS

Exploring new microcomputer chips for complex arithmetic, I/O and Data Communications system functions.

Organizer: Alan J. Weissberger
National Semiconductor

8. THE 1980's – USER CONSIDERATIONS AND CONCERNS

Users and industry experts look to the next decade, and make their predictions on available products and problems on reliability, delivery, programming, costs, personnel considerations and other concerns.

Organizer: Ed Bride
Computerworld

Wednesday 9:30 - 12:00

1. INTERFACING THE ANALOG WORLD

The challenges of interfacing the analog world to mini and microcomputers so they can do useful work.

Organizer: Larry Brown
Calax

2. MICROCOMPUTER & MICROCONTROLLER INDUSTRIAL APPLICATIONS

Most industrial applications call for efficient solutions to unique, but low volume, problems. The papers in this session will describe how micro computers can be used in these situations.

Organizer: Doug Cassell
Control Logic Corp.

3. MINICOMPUTER MAINTENANCE

Maintenance has become a vital user concern in the application of minicomputers. This session will address the maintenance issues confronting a potential user of minicomputers in a panel discussion format.

Organizer: Tom Winker
Hewlett-Packard

4. MINICOMPUTER DISTRIBUTED PROCESSING

Exploring the use of minicompuers for distributing processing to achieve fast, more reliable, locally controlled processing.

Organizer: O.C. Zatyko
General Automation

Wednesday 1:30 - 4:30

5. OEM PERIPHERALS IN END-USER SYSTEMS

Exploring the trials and tribulations of using peripherals supplied by outside manufacturers from both the suppliers and user's viewpoint.

Organizer: Jordan Backlar
Digital Design

6. MICROCOMPUTER APPLICATIONS

An exploration of the problems involved in applying microcomputers to totally new application areas for computer technology.

Organizer: Jerry Ogdin
Microcomputer Techniques

7. MINICOMPUTER DATA BASE MANAGEMENT

Data Base management capability is a relative newcomer to the minicomputer market. This session will concentrate on how to use DBM packages and what these packages can actually do.

Organizer: Fred Gibbons
Hewlett-Packard

8. MILITARY MICROCOMPUTER APPLICATIONS

An all-day session on military applications of microcomputers focusing on the special nature of military requirements, standardization and procurement.

Organizer: Joe Genna
Delco Electronics

Thursday 9:30 - 12:00

1. MINICOMPUTER MANUFACTURING MANAGEMENT SYSTEMS

The manufacturing management session will investigate the techniques and benefits of computerized manufacturing management (MRO). A case history of a complete on-line manufacturing management system implemented on a minicomputer will be discussed. The costs-versus-benefits and the process of evaluating and selecting a computerized manufacturing management solution will be analyzed.

Organizer: Sandy Kurtzig
ASK Computer Services

2. THE NEXT GENERATION OF COMPUTERS

Will it be a generation of computers or computing? Panel discussion.

Organizer: Jon David
Systems ROI

3. FINANCING A GROWTH COMPANY IN TODAY's ENVIRONMENT

A session exploring the difficult task of multisource funding for today's high growth, high technology companies.

Organizer: Christian C.E. Hobich
Hobich Ventura Managmeent

4. MINICOMPUTER RELIABILITY

Distributed data processing and on-line data collection systems increase the importance of 100% computer reliability. This session will address the fail safe aspects of this problem.

Organizer: Arnold Kallar
Infosystems

Thursday 1:30 - 4:30

5. SMALL BUSINESS SYSTEMS

Minicomputers are being applied to small business applications never reached by large computer systems. This session will address what a minicomputer based business system can do today and will do tomorrow for small businesses.

Organizer: Don Schnitter
Basic/Four Corp.

6. COMPUTER LAW

Organizer: John Kirklay
Datamation

7. THE COMPUTER HOBBYIST

The exploding microcomputer business has created a new hobby — microcomputers. This session will address the needs, contributions made, and problems encountered by computer hobbyists.

Organizer: Adam Osbourne
Osbourne Associates

8. MICROCOMPUTER DEVELOPMENT TOOLS

An all-day, two-part session covering both hardware and software development tools for microcomputers.

Organizer: David Millet
NEC Microcomputers

Conference Program Chairman: Robert J. Frankenberg (Hewlett-Packard)

Notes:

(1) Thursday is also "Paper Day," consisting of a series of papers that are not necessarily related.

Organizer: Dr. L.A. Lotito
Varian Data Machines

(2) Each session consists of 3-6 authors/panelists.

Exhibitors

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Minis, Satellites Cut Marine Corps Turnaround 300%

By J.G. Hanks
And A.H. Ingram Jr.
Special to Computerworld

CAMP PENDLETON, Calif. – A distributed processing system using a minicomputer host linked to military minicomputer satellites and medium-scale systems is credited with reducing turnaround time about 300% over the previous methods used at the Marine Corps Tactical Systems Support Activity (MCT/SSA) here.

The MCT/SSA Computing Facilities (MCF) system is a network of military and commercial computers which provides tactical systems program development capabilities.

The military computers, Univac AN/UYK-20, AN/UYK-7, CP-808 or CP-890 host CMS-2 operating systems and are satellites to a Digital Equipment Corp. PDP-11/70 supermini which is the central network controller and provides I/O spooling, job scheduling and other I/O services for the network.

Jobs are entered into the MCF system through a DEC PDP-11 spooled card reader or other input devices and are routed by job scheduling via the PDP-11/70 to the satellite system.

As jobs run concurrently, one per satellite computer, all line printer output is spooled for eventual printing. At the same time, multiprogramming and real-time applications may occur on the PDP-11/70.

The system is designed so little modification is made to the existing military computer software. The PDP-11/70 is linked to the military computers using Navy Tactical Data Systems (NTDS) interfaces.

The Standard Navy Compiler Monitor System (CMS-2) operating systems treat the intercomputer link as an I/O channel having a card reader, a card punch, a line printer and tape drives. A PDP-11 device driver package is included in the military computer software, effecting the network line.

By servicing the NTDS requests that are made by the satellite computers, the PDP-11/70 controls the network.

The hardware configuration of the network computers is flexible. The model of the PDP-11 and the input/output devices it uses are widely variable. The choice of hardware attached directly to the satellite computers is also flexible.

The MCF system software is a set of programs that operate under the RSX-11D Version 6B real-time Executive on the PDP-11/70. The functions of these programs are:

- Input spooling/job batching. Disk-based card-image files are created from card decks (representing MCF jobs) by a modified RSX input spooler program. The input spooler passes the files to the MCF batch monitor program which initializes and queues the jobs for execution. The batch monitor also accepts input files (representing jobs) specificed by an operator command.
- MCF Executive. This performs operator communications and overall control of the MCF system. Some functions of the executive include job queue managment, communicating with active jobs, configuring the devices in the system and displaying job and system status.
- NTDS device handlers. NTDS communication with the satellite computers is accomplished by standard RSX-11D device handler tasks. There is one handler task per satellite computer.
- MCF Service programs. All satellite computer I/O requests are serviced by

(Continued on Page S/18)

Cost Savings Cited In Conglomerate's Distributed Net

By J. Keuller
Special to Computerworld

BRUSSELS, Belgium – Five years ago when we established our company, a management decision was made that only centralized computing was to be used.

However, we are now leaning toward decentralization with an IBM 370/125 aided by 10 satellite minicomputers from four different vendors.

Societe Belge D'Etudes et de Realisations Informatiques SA (SBERI) will be five years old on Oct. 1. It is a member of the Empain-Schneider (E/S) Group, an industrial conglomerate of more than 200 firms whose consolidated turnover exceeds $5 billion.

Within the E/S Group, our company acts as a DP service bureau with over 60 firms, mostly Belgian, as clients. We have been pleased with the cost savings the distributed network has afforded us.

One of the minis in the network, an IBM 3/8, is used by a piping contractor for data collection and validation applications.

A cardboard factory uses a Digital Equipment Corp. PDP-11/40 to record production data via 11 RT02 terminals. The system is also being used to control customer order flow. The factory is scheduled to soon implement a production scheduling application to optimize its cuttings.

A Honeywell 61/60 is installed in a bank where it collects data and produces daily statements of accounts. An engineering contractor uses three DE 523s from Olivetti as data encoders or remote job entry (RJE) workstations. Another Olivetti machine, a DE 525, performs order processing and inventory for a small pharmaceutical company.

Five MTS 7500s from Honeywell are being used for personnel management; customer order servicing is planned for the systems.

Although all the installations are completely independent and different in almost every respect, they share two things in common. First, they were designed after a thorough feasibility study and implement by the SBERI team. Secondly, communications with the central computer has been standardized by IBM 2780 emulation under Power/VS/RJE.

As a result, the move toward decentralization was easy; it is not exaggerated to say it has been a success.

Like everybody, we suppose, we have encountered some problems with the communications lines. We mainly use ordinary leased 4,800 bit/sec lines.

Problems have also occurred with the software and, in particular, the emulators and with the RT02 terminals.

But they seem like trifles when dealing with success.

Sci-en-tif'-ic: eminently learned or skillful
Busi'-ness: any of the various operations or details of trade or industry
Sys'-tems: orderly combinations or arrangements of parts, elements, etc., into a whole

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Star-Shaped Network Fits Wholesale Decentralized Pharmaceutical Facility

By Hans J. Loge

Special to Computerworld

Messrs. F. Reichelt AG is a pharmaceutical wholesaler in northern Germany with a decentralized organization. The company's head office is in Hamburg; sales offices and depots in 11 other towns are controlled by the head office.

A network including the hardware of different manufacturers (Univac, Honeywell Bull, Olivetti) was developed to handle the order entry and processing in the sales offices and the commercial and organizational functions in the head office of the company.

The total system was designed in 1973 and brought step-by-step into operation from 1974 to 1975. The goal was to develop an economic solution that met the company's needs for reliability and security and also requirements regarding the response time of the system.

The overall design is based on a star-shaped data network with private lines (4,800 bit/sec). In the center of the network (Hamburg), the central processing unit, a Univac 90/60, is installed.

The CPU performs invoicing, ordering and central file maintenance, as well as all the other classical DP functions.

Each of the sales offices, which represent the end points of the network, is equipped with a Honeywell System 700 minicomputer for order entry, inventory reporting and preparation of delivery notes, with one Olivetti on-line printer for backup.

Univac display units can be connected directly to the line. All devices use the Uniscope 100 line procedure in multipoint connection.

Each System 700 uses its own customer file (of about 1,000 customers) and article file, the latter containing the stock quantities which are updated in real-time. The files are loaded by the central processor via the line and updated (such as in the case of price changes, new entries, etc.).

Each minicomputer has two to 12 high-speed displays for the input, identification and booking of the order data according to quantity and article name.

The display units are operated by telephone operators who call up the customers up to four times daily, according to a fixed schedule, and type the order directly into the System 700 via the displays.

To avoid any cost increase, a response time of less than .5 sec was required for the display units, and this was achieved.

The order data is temporarily stored in a buffer file and sent to the central processor for invoicing and discounting when input is completed. After these functions have been carried out, the central processor returns a picking list which is sorted in the picking order of the warehouse. The picking list is also the delivery note and invoice.

To perform the order collection functions with the System 700, Honeywell Bull Germany created a software package, PBS, with the collaboration of Reichelt.

Based on the real-time operating system OP-16, a screen-oriented software pckage, Bisop, was developed. This allows the writing of application software in the high-level language Screenwrite.

In addition to the actual order collection, PBS includes a comprehensive reliability concept which allows for continuation of order entry even when a system component fails.

For example, the order entry and output of picking lists are possible even when there is a problem in the connection between the System 700 and the host system or a failure in the host system itself.

Loge is with Honeywell Bull systems support in Eschborn, West Germany.

Whither Minis? The Squeeze Is Coming

(Continued from Page S/7)

gard to computer size: batch and remote processing, transaction processing and time-sharing.

With the right kind of software, a minicomputer could compete very well in all of these functional markets, although minicomputers generally are more at home in the real-time, interactive world. Thus, they generally do transaction processing and time-sharing well.

More and more large banks and other corporations are discovering one way to keep computer costs from rising is to disperse computer power. New applications are implemented on minicomputers. Large mainframe computers are being off-loaded to minis.

Despite computerizing more applications, costs are not going up. Minicomputers do provide low-cost computer power. For smaller systems, operating systems can be less complex and more efficient.

This is a potentially large market for minicomputers. When a minicomputer saves money over a large mainframe for a particular application for one company, competitors look for similar cost savings. This market could snowball in the next few years.

Minicomputer manufacturers are seeking ways to market to their natural customers, small businesses. The computer is the right size, but the minicomputer manufacturers' marketing and sales support forces are too small.

Some mini manufacturers have essentially extended their marketing and sales support forces by using local system houses as sales representatives.

The problem of maintaining quality control over such widespread independent businesses has yet to be solved. The reputation of a particular minicomputer manufacturer will tend to be that of the local representative.

Users will reap the benefits as minicomputer manufacturers answer these questions. Minis have been a major factor in bringing the cost of computing down to a price affordable by small businesses.

They have also allowed sharp DP managers to stabilize computing costs in the face of inflation and added applications.

It is largely minis that have made terminal-oriented, interactive processing possible, freeing users from the inflexible straitjacket of the batch world.

Thus, as the minis move out into the micro world, users can expect even more cost reductions. Minis in networks will guarantee that small networks can be set up without investing millions of dollars. Minis in the commercial world will force the large mainframes out of the batch world.

Bartik is product manager for high performance CPUs at Interdata in Oceanport, N.J. 07757.

Marines Cut Turnaround by 300%

(Continued from Page S/17)

these programs. I/O devices simulated by the service programs are card reader, printer, card punch and mag tape.

- MCF Utilities. The utilities consist of a set of off-line RSX functions supporting data conversion to and from MCF formats and a set of MCF/RSX system maintenance procedures and programs.

Data flows through the system from card decks representing MCF jobs which are read on the PDP-11 card reader or remote job entry (RJE) terminal command and transformed by the input spooling task into a job input stream file.

The job input stream file is analyzed by the MCF batch monitor, which creates the job's log file. During the service program execution, input data consists of NTDS communications messages from the satellite computer, operator messages and control information from the MCF executive, the job input stream, log and previously created simulated tape files on the PDP-11 disk.

Output data consists of operator console messages, NTDS communication messages to the satellite computer and listing, log and simulated tape files.

When the service program detects the end of the job, it (optionally) queues the listing and log files for printing by the RSX output spooler task. These files are then printed on the PDP-11 line printer.

Normal end-of-job processing may include deleting the job input stream, listing, log and any simulated tape files as designated by the user through MCF job control language (JCL).

Hanks, a captain in the U.S. Marine Corps, is with MCT/SSA at Camp Pendleton, Calif. Ingram is with Rockwell International's Marine Systems Division in Anaheim, Calif.

Power Choses Mini Power

In-House System 'A Fraction' of Time-Sharing Costs

By Esther Surden
Of the CW Staff

SCHENECTADY, N.Y. – When an electrical utility consulting firm here overloaded its time-sharing vendor's mainframe, it decided to look at minicomputers as an alternative for its number-crunching applications.

That was in 1972, according to Power Technologies, Inc.'s senior engineer, Richard Mills. The company realized the amount of work it had been running on the time-sharing service's IBM system could run on minicomputers for a "fraction of the cost we had been paying."

Many minicomputers were considered, Mills said. However, at that time, the Hewlett-Packard (HP) 2100 system seemed to have "the best software for the applications."

The disk operating system was "impressive," he added, explaining his company didn't need proficiency in real-time applications but rather good time-sharing and batch capabilities.

The three HP systems, however, are on their way out and will be replaced by two systems from Prime Computer, Inc. that are already installed at Power Technologies.

When the company needed to expand its capabilities, it found out about the Prime systems through word of mouth, Mills said. Tests run on the prime 300 and 400 systems showed they would be better for number crunching, he explained; and one of each was obtained.

At present, all five systems are being used by the company. The HP minis are connected to one of the Prime systems through RS-232 ports for accounting functions with the Prime mini keeping track of the time used for the different applications on each.

Otherwise, the systems are stand-alones and none is dedicated to a particular job, Mills said.

The minis are used in two primary application areas at the company. The first is to study stability, load flow and, in general, long-term planning for electrical utility companies. These programs involve the heaviest number crunching, he said.

The second use is in program development for the utility industry on a contract basis. The company also offers specialized industry application packages it develops on the minis for sale to the utilities.

"The only reason we still have the Hewlett-Packard systems is that the software hasn't all been converted to run on the Prime," Mills explained. When it is, the Prime minicomputers will carry the company's entire processing load.

The configurations for the HP minis are all alike. Each has 32K words of memory, 5M bytes of disk, a CRT, console, paper tape reader/punch and a plotter as well as Digital Equipment Corp. Decwriters.

Each Prime configuration has a total of 224K words of memory, two 12M-byte disks, and 32 ports for user terminals; magnetic tape, a line printer and an electrostatic printer/plotter are "juggled between the CPUs depending on the applications," Mills said.

The five systems represent a total hardware cost of about $300,000, he added, an economical solntion to the company's problems.

The firm's business requires large programs that take a lot of core to run. "It's hard to call the Prime 400 a mini," Mills said. "It can accommodate up to 8M bytes of main memory and 1.2G bytes of disk, and we will expand the system to take care of our needs."

For example, the company is in the process of developing a stability and load flow program: This program will run on the Prime 400, which will be outfitted with 1M words of core.

"This may be the only 16-bit mini around that will allow you to do this," Mills said.

Reliability on the systems has been good, he added. The Prime minis are serviced from that vendor's Framingham, Mass., home office.

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Janitor Service's System Cleans Up Customer Queries

HACKENSACK, N.J. – "Where's the truck with my order?" "I need a couple of cans of wax; do you have them in stock?" "Hey, how come I received an overdue notice; I just paid my bill."

Customers telephone such inquiries into the Hackensack, N.J., office of John A. Earl, Inc., a distributor of janitorial supplies.

And, until recently, the reply was: "I'll have to call you back."

What changed all this was an NCR Century 8200 mini run under the NCR Spirit on-line order entry system.

Customer, order and inventory records on a master file are immediately accessible, according to the user.

Indexing a single order number into the keyboard of a visual display terminal, for example, produces a response as to whether the items have been picked, shipped or invoiced. At another time, an item number entered through the CRT will display the status at that moment of any one of the firm's 3,500 products in stock.

The system also prompted changes in warehouse management. Stock has been assigned permanent, sequential bin locations, simplifying physical inventory taking and almost eliminating dead items, according to Tony Crisafulli, operations manager.

Another benefit of the system is that, by knowing what is on hand, available and on-order at all times, the company, barring unforeseen circumstances, is able to fill orders as they are received.

The firm, which serves more than 2,500 customers in New Jersey and parts of New York City and Long Island, had determined for some time that a change was in order. But matters did not become critical until after a couple of supermarket chains became customers, and sales increased 15% in a year to $2.5 million.

"We were at a point where sales were getting better, but operations were staying at the same level," Crisafulli said. "There was too much paperwork and it was either increase people or take another route."

The company chose the system after considering the IBM 3 and minicomputers from Basic Four Corp., Singer and Nixdorf. It seemed to give more of what we wanted without needing a programmer," Crisafulli noted.

The only change was in reporting sales commissions, he noted. The report, available at any time, enables the company president, Donald B. Earl, to pinpoint errors and determine each customer's contribution to sales and profits.

The sales force is given similar figures and, when matched to picking tickets and invoices also generated by the computer, they can figure commissions and profitability, Crisafulli added.

An order entry clerk, given only a few hours of on-the-job training, is led through each transaction, selecting the functions and entries from instructions displayed on the terminal screen. The computer verifies each entry, rejecting any incorrect data, Crisafulli noted.

Order entry clerk "runs the company" through the NCR Century 8200 at James A. Earl, Inc.

After the orders have been entered, the computer prints picking tickets and packing slips. The orders are filled in the warehouse and, after shipment, invoices are printed.

Once orders, payments, stock receipts and similar information are captured on the computer, any number and variety of reports are available. These can include a credit exception report, an out-of-stock/below minimum listing and a summary of back orders, among others.

Eventually, accounts payable, general ledger, sales reporting and route analysis will be incorporated into the system, he added.

Applications Seen Key to Minicomputer Successes

(Continued from Page S/12)

shouldn't feel too insulted if he is called a fool.

A typical gimmick so successfully used by computer vendors is to hide the costs for personnel prior to installation of the computer.

The items that need to be included in the total DP cost are:

- Cost of the equipment (including auxilliary equipment such as data recorders).
- Cost of hardware maintenance.
- Cost of programming.
- Cost of program maintenance.
- Cost of computer operation.
- Cost of facilities.
- Cost of conversion.
- Cost of ongoing management support.

Each and every one of the above listed items does generate a cost; don't be lulled into believing some of those categories do not apply to you. There has been more than one overeager computer salesman who has been successful in making the buyer believe the cost of programming is incidental and insignificant.

Clearly, complex problems require the services of people trained to handle the problem in question.

How will a user know the DP expert he is turning to is qualified to do the job? Frankly, unless the firm he is contacting has unimpeachable credentials, he is on his own again. The only defense he has is a contract which guarantees results which he can measure unequivocably prior to having to hand over his hard-earned cash.

Of course, to stop the passing of the buck it is highly advisable to deal with one source only for all of the necessary services. The user should make one other basic policy decision: deal with only one organization which will supply all products and services.

Dinter is president of Computer Management Corp. in Miami.

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In Distributed Processing

Micro Dreams to Come True Soon

By Ralph Gabai
Special to Computerworld

CHATSWORTH, Calif. – By the end of this decade, those far-fetched dreams of computer industry pundits of the late 1960s will actually be coming true. By then, microcomputer-based systems will be in use in hundreds of applications where mechanical devices are now supreme.

And by 1984 the microprocessor and its mini peripherals will be used in applications that even the bluest of blue-sky reports haven't yet predicted.

Why should applications that were expected in the mid-1970s finally bear fruition at the end of this decade?

First, there is the plunging cost of intelligence – the chip itself. Second, there is the new breed of peripheral equipment, which is also dropping in cost – though not as quickly or drastically as the microprocessor. Finally, there is the acceleration of user imagination. In recent years, end users have gained greater understanding of how and what they can do with a computer.

This latter trend is documented by the birth and sudden emergence of the computer retailing establishment. Across the country, there are approximately 25 stores selling microprocessors and peripherals to individuals who work in some technically related industry, but not usually the computer business.

During this year, these retail computer systems customers will buy $15 million to $20 million worth of products alone. Not a large amount, but indicative of the mass interest in computers.

That interest is clearly evident today in such industrial application areas as small business machines, process control, automotive, test equipment, word processing, nonmilitary governmental use and medical test and application.

Small Businesses Untapped

Take, for example, the small business. The minicomputer specialists define small businesses as firms with 20 employees and up doing sales of $500,000 and up. That eliminates the prospect of designing systems for 90% of what are truly small businesses – all the retailers and service operations that are in the $100,000-plus range.

Now, however, the microprocessor makes it possible to design systems for small business users and to gear peripherals as easy-to-handle tools for noncomputer people.

When it reaches a point where one can buy a computer system fully programmed for $3,000, is it inconceivable that an independent dry-cleaning operation will have one in its place of business? Or isn't it logical that the inventory-intensive merchants will have small systems linked to their suppliers?

Clearly this makes a distributed network critical in areas such as books, phonograph records, fashion merchandise, hardware and building supplies and thousands of other similar types of businesses.

There is a need for terminals, disk drives, data collection devices, noncompatible low-cost tape and modem communications, all at lower prices and all human engineered so they can be utilized by a nontechnical user in a real-world environment.

According to industry studies, peripheral content in microprocessor-based systems is currently half the equivalent sale price of the system, but is expected to increase to up to 80% over the next five to 10 years.

Distributed Processing

Let us take the example of a distributed processing application. As the cost of computer intelligence continues to drop, it becomes logical to increase the level of computing power at the source location. The availability of this hardware is more than a component in the distributed processing chain, it is a catalyst that makes distributed processing grow.

The greater the use of microcomputers for distributed processing, the more the prices will come down, including the cost of peripherals. And, as prices drop, the more applications will become practical. The more applications that become feasible, the more use of small computers. And, the more computers in the field, the more opportunity to link them to a host computer, thus producing more distributed processing.

To reach this stage, the market will need to get by with as few peripherals as possible and as simple a peripheral as feasible. Often, micfoprocessor peripherals will be combined. Office products that are not now considered computer peripherals will be engineered to do double duty.

Within 10 years, word processing systems will be affordable by every office of almost any size in the country. Those systems will have essentially this same capability of today's $10,000 to $30,000 word-processing system, but prices could easily be 50% to 60% lower.

In most installations, this will create a new future for tape and disk storage, but in larger applications one host machine will control many satellite microprocessors and printers in a distributed mode.

Gabai is vice-president of marketing for Pertec Corp.'s Peripheral Equipment Division in Chatsworth, Calif.

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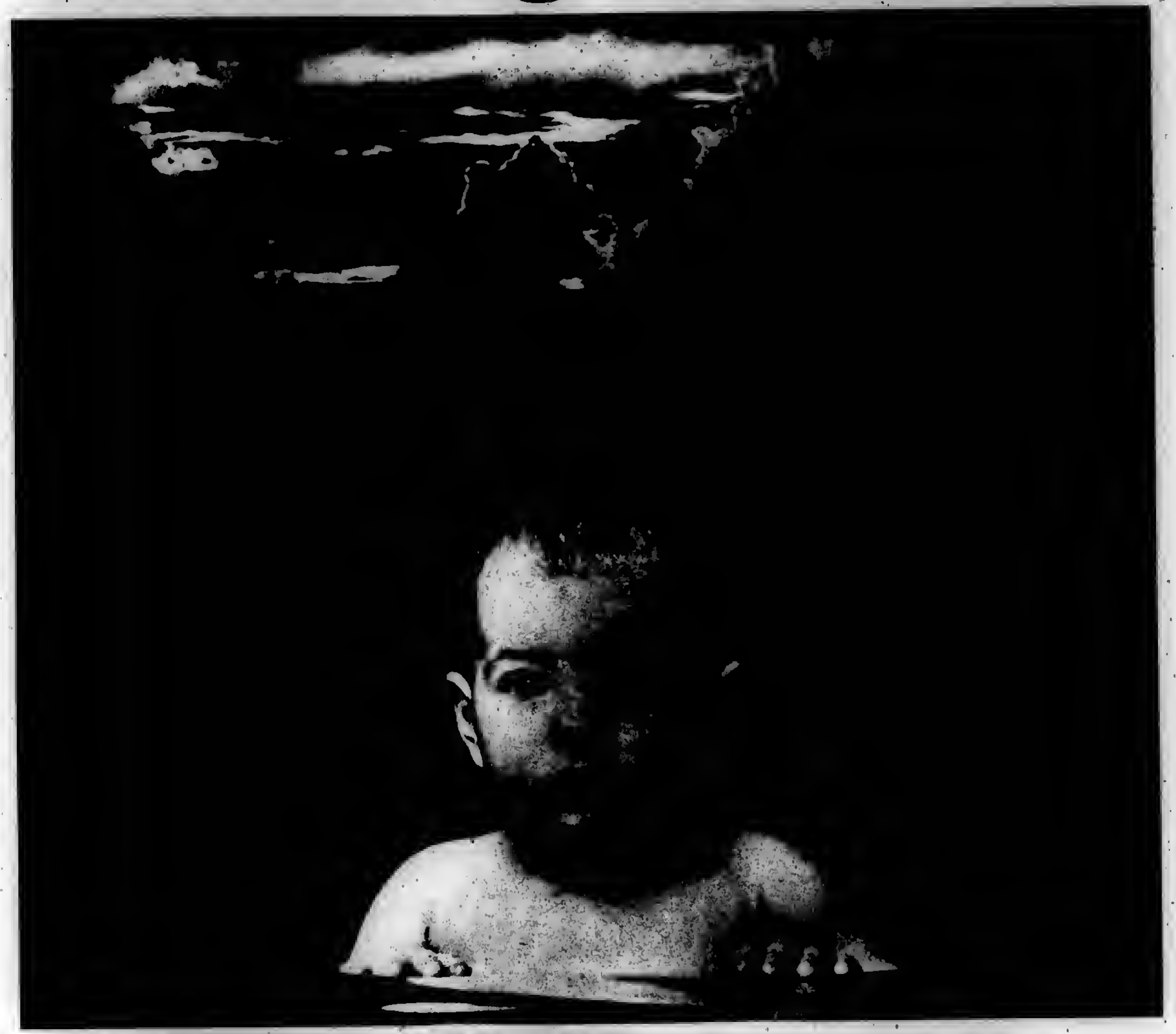
The emergence of a new thinking machine.



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Mini Bits

Signal Processer Features Smart Memory Architecture

WALTHAM, Mass. – Compass from Signal Processing Systems, Inc. is a minicomputer-based signal-processing system featuring an enhanced memory architecture, the firm said.

The system's memory is composed of several separate modules of different sizes and speeds, but is viewed as one homogenous memory by the signal processor, a spokesman noted.

The memory architecture includes control logic that handles the synchronization of tasks between multiple processors, he added.

The system includes software that permits multiprocessor programs to be written in Fortran, the firm said.

A basic Compass system includes a minicomputer interface, an SPS-41 signal processor and 8K of the memory. The minimum system costs "under $30,000."

Multiple processors and more memory can also be configured, the firm said from 223 Crescent St., Waltham, Mass. 02154.

Icom Offers Floppy System

CANOGA PARK, Calif. – Incom Inc.'s Model FF36-1 floppy disk system was designed to operate with Intel's SBC80/10 single-board computer, the vendor said.

The unit includes a disk drive with daisy-chain capability, an IBM-compatible controller and cables and connectors. Also provided is Icom's 360-56 interface card for the SBC80/10.

The interface card plugs into a slot in the Intel card cage and contains a software driver programmable read-only memory and Icom's disk-oriented software.

The Model FF36-1 costs $1,495. The firm is located at 6741 Variel Ave., Canoga Park, Calif. 91303.

Micro System Unveiled

DALLAS – International Computer Products, Inc.'s TD-1 Termidisk communications-oriented microcomputer is equipped with one to four standard IBM-compatible diskettes, the firm said.

The unit is designed for data collection, time-sharing computer usage and business communications, the company noted.

Communications with terminals and modems is through standard serial ports equipped with RS-232 or current-loop interfaces, according to the company.

The unit costs $2,450 from 2925 Merrell Road, Dallas, Texas 75229.

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Manufacturer Cuts Costs With Turnkey

By Esther Surden
Of the CW Staff

ENGLEWOOD, N.J. – A manufacturer and distributor of metal trim and fasteners for apparel here is saving $20,000/year and has increased management control with a turnkey minicomputer.

Prior to the system's installation, the company used a service bureau to handle accounts receivable and did the inventory manually.

An in-house system seemed to be the way to go to increase efficiency and minimize costs, Bernard Chalfin, the firm's vice-president noted. He attended seminars and business shows and talked to several manufacturers, including IBM, Keydata Corp. and Basic Four Corp.

The systems "just didn't satisfy the firm's requirements. So, we ended up with an Ultimacc system because the company was small enough to give us a custom system," Chalfin said.

Because "we had as one of our parameters that we didn't want to hire a systems manager," the company turned to a turnkey system, he explained.

C&C Metal Products, Inc. here supplies trim to firms using metal decorations in their manufacturing process. The decorations for the footwear industry are sold by an affiliate, Amershoe Corp., and a second affiliate, C&C Amershoe International Corp., handles export sales.

For the past 18 months, the bookkeeping and accounting procedures of the firm and its two affiliates have been run on an Ultimacc turnkey minicomputer system from STC Systems, Inc., a spokesman said.

Staying Power a Consideration

"Certainly we were concerned with the staying power of the company, especially at the time we bought during the recession, but we were impressed with the personnel and felt the company would have turned over to us the history and required software data so we could find others to tackle the service if the need arose," Chalfin continued.

The configuration at C&C includes a minicomputer with 46K bytes of core, two 5M-char. magnetic disk storage units, two CRTs and one 245- to 1,100 line/min printer. The system represents an investment of about $100,000, he added.

The firm has eliminated $800/mo in service bureau costs and has saved one salary from the order entry department representing a $12,000/year savings, Chalfin estimated. This was accomplished through reorganization and attrition, he noted, and no one was actually fired because of the system.

At C&C, Ultimacc handles all daily business transactions, including order entry and billing accounts receivable, accounts payable, general ledger, customer sales analysis, item sales and profitability analysis, inventory status reporting and commission processing.

Separate Identities

Each of the company's three corporate entities has its own company code with customers classified by type of business (jobber, belt manufacturer, shoe manufacturer, etc.) and products classified by type (covered button, nailhead, eyelet, etc.).

When the system became operational at the beginning of 1975, C&C was using 17 codes for customer categories and 23 codes for product categories, but the system can accept up to 28 customer codes and up to 36 product codes, Chalfin noted.

For the most useful processing and reporting of business information, C&C management asked the turnkey house to provide each marketing unit with its own separate identity. The system provides this capability for all major functions.

C&C's typical daily entry volume of 200 orders, 220 invoices, 150 cash receipts, 100 inventory adjustments and 50 accounts payable are accommodated by the system.

One of the system's many features favored by C&C is automatic price changing, Chalfin emphasized. To increase or decrease the price of each item in any product category on the item master file, the operator need only enter the product category and the percentage of price change. The results are available by calling up an item master file listing or by displaying individual items on one of the CRTs.

The cost of each item is broken down into its various parts as well, Chalfin noted. Costs of tool manufacturing and production, secondary operations, overhead and sales commission are available for each item, he added.

"We can process an order without a computer," Chalfin noted, so if the system goes down the entire business won't go down with it. "Our prime concern is shipping, not billing," and, if necessary, the bill can be delayed a bit.

"If you had asked me two years ago

(Continued on Page 37)

Ball Unites Hardware, Software In System for On-Line Control

SUNNYVALE, Calif. – Ball Computer Products, Inc. has a minicomputer hardware/software package designed for on-line production and inventory control in manufacturing and distribution firms.

The Inventory Control System (ICS) includes a 16-bit Data General Corp. minicomputer, disk-based operating system and data management software.

The ICS packaged software, written in the firm's Dasl language, includes programs for inventory control, net change material requirements planning, bill of materials processing, order entry, accounts receivable, payable, cash flow analysis, general ledger and budgeting, Ball said.

Multiple CRT terminals can be used to concurrently perform different functions, a spokesman noted. For example, he explained, one CRT can be used for order entry while another issues parts from a stockroom.

An audit trail is maintained on magnetic tape; in the event of hardware failure, recovery procedures are transparent to the user, Ball said.

The minimum ICS configuration includes a 64K mini, two CRTs, 5.8M bytes of disk and a control console with a hard-copy printer. The system can be expanded to 16 CRTs and 400M bytes of disk with additional peripherals available, the firm said.

The hardware costs $37,900; the software is priced at $8,000 with optional packages available. Ball is at 860 East Arques Ave., Sunnyvale, Calif. 94086.

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New Software Almost Always Good, But Don't Be Surprised by Problems

By Jon David

Special to Computerworld

Minicomputer Exchange

It finally works! The mini hardware, ornery at first, was finally tamed and is now well behaved. The applications programs, beautiful in concept but filled with sufficient bugs when tested to be a veritable computer plague of locusts, now work and provide subtotals that reconcile with reality.

You sit back and relax, priding yourself in being one of that small minority group with properly working computer systems.

Your salesman visits you just to check that everything's going OK and asks you if you'd like the newest software release. With all the hardware peculiarities and applications problems you were living with, you had really forgotten that there was operating system software.

Let's see, it's Version 6.03 you're working under, isn't it? And he's offering you 6.04; 7.01 or some other larger number.

This new software, offered to you for nothing, boasts many improvements and enhancements over your present software. Why in the world shouldn't you take it?

Because you've got common sense, that's why.

Most people view counting as 1, 2, 3, 4, 5, 6, etc. Not so with those people that supply system software. After 3 we find 3.01, 3.02, 3.04 (they never tell you what happened to 3.03), 3.05, 4, 4.01 and the like.

Numbers?

What do those numbers mean? A minicomputer manufacturer provides an operating system. Needless to say, unfortunately, there are things in it that don't work quite right, things that don't work at all and things that are dependent on the phase of the moon.

The manufacturer, aware that his hardware does not make as good an impression as he feels it should if it doesn't have properly working software, issues patches, fixes and other such corrections to make his software livable.

Every so often the corrections that must be supplied with a particular version (also known as a release) of an operating system has too many corrections to be easily installed; a .01 is then born, supposedly incorporating the corrections.

Often it includes certain improvements that the manufacturer was thinking of putting in when time permitted. More often, it still doesn't work right. That's why we get .02s and .03s.

Normally the upward revisions within the same basic number should all offer the compatibility feature, but this is not always the case. Although new revisions within the same number set should be the old set plus improvements, quite often things that worked under the old set do not work with new release software.

If you think you have troubles going from 3.06 to 3.07, wait until you try the Release 4 software. This is so drastic a change even the manufacturer would not presume to use the same basic number identifier. Obviously, it is in all ways better than what you are now using.

Readers are urged to reply to this or any other Minicomputer Exchange article. This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area. Letters or manuscripts should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space please.

Just don't expect that it will work or be compatible with what you have, regardless of what anybody tells you.

Let us say that you do install new software. How might this effect your operations?

First, you may try to run your programs and discover that for some mysterious reason the new system will not recognize them; it might recognize your programs, but not your data files; it may recognize your data files; but be unable to read them.

You may get into execution only to discover that you get a system message: INSUFFICIENT MEMORY. New systems frequently take up more space than the ones they have replaced.

Maybe you will be extra lucky and your system will perform the way it should. At the end of the day you go to copy your newly updated data files and discover the system copy program, working just yesterday under the old system, no longer works with the new system.

Problems? Yes and No

Are there always problems? No. Are there frequently problems? Yes.

Are the new problems always critical? No. Are they always inconvenient? Yes.

Can they always be gotten around some way or other? No. Will the manufacturers normally help you with new problems? Yes.

Are you often better off than you were before? No.

In the past year my firm has been working with software from one particular manufacturer. We have gone from Version 3.02 to 3.03, to 3.04, moved up to 4.00 and 4.02 (note the omission of 4.01) and are now at 5.00.

We did not have upward compatibility even within the 3 series Does that tell you something?

From time to time my company provides software as either a separate product or as part of a turnkey system. We deliver such software with a lifetime guarantee. There are many conditions that must be satisfied for this guarantee to take effect.

All of these conditions are what we consider to be reasonable: we must be provided with a computer-intelligible copy of the programs we deliver to a customer; any programming change by the customer without our written approval voids the guarantee; the guarantee is only valid under the operating system in use at the time the software was delivered. Does this tell you something?

Computer manufacturers regularly change file and directory structures, utility and library routines and the like as time goes by. Although there may be many exceptions to prove it, the rule still is that new software will have problems not present in the old software. Why ever use new software?

New Better Than Old

By and large, new software is actually better than old software. If you are in a development phase, it makes sense to choose the best available, as we did.

In any event, you can frequently get what is not working in a new release from an old release. Software representatives of the manufacturers are always trained to deal with recent software, but often not with older software; the later your software release version, the more likely you are to receive prompt and competent manufacturer support should a problem arise.

New software is almost always a good thing eventually. Eventually, however, can be a day, week, month or year from when it is first delivered. If you have an operational system, avoid new software until it has proven itself.

New versions of software are sometimes necessary to support new peripheral equipment. The key word here is "necessary." You have no choice.

On the other hand, a new version may just offer enhancements where enhancements represent unproven changes to your proven operations. Indulge at your own risk!

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and is also president of Systems RDI.

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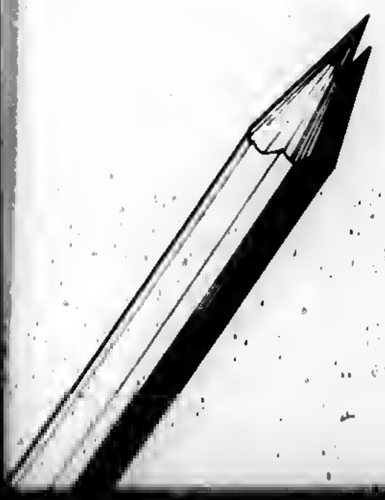

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Two at Sea, One on Land

Three Minis to Aid in Mediterranean Pipe-Laying Job

By Esther Surden
Of the CW Staff

GREAT NECK, N.Y. – A company laying pipeline under the Mediterranean Sea – a pipeline that will eventually carry natural gas from Tunisia on the North African coast along the floor of the Sicily Channel to the Island of Sicily two miles off the Italian mainland – will have a lot of calculations to do.

Especially when the stretch of ocean bed is marked with steep peaks and valleys swept by subterranean currents.

The Sperry Equipped Automatic Navigation and Control for Offshore Requirements (Seancor) program from Sperry Systems Management here, which incorporates Systems Engineering Laboratories' (SEL) 32 minicomputers in its data acquisition and processing system will be used to control the pipe-laying operation for Saipem SPA, an international contracting firm headquartered in Milan.

Three-Mini System

Two of the minicomputers will be shipborne on the Castoro VI, a twin-hulled and semisubmersible pipe-laying vessel. A third mini will remain on shore for program development and backup, according to Jerold Mann, program manager.

The systems will control the pipe-laying operation by allowing the pipe to be laid continuously in water as deep as 2,000 feet, with winds up to 50 knots, water currents of two knots and wave heights of 17 feet, Mann said.

The system is in charge of the launching of the pipe on the assigned route and will control the shifting of the vessel in order to keep all possible movements within the limits of allowable stresses in the pipe, as well as to obtain an easy and safe launch operation, he noted.

The system will also control the equilibrium of the barge during the pipe settling and during stationary operations, considering such variables as environmental forces, pipe pull and any mooring line forces whose anchors are being lifted and shifted.

"The main problem in laying the pipe is holding the barge in position while the construction, or joining of the pieces of pipe, takes place. When a new piece of pipe is laid, the barge automatically moves forward," Mann said.

The SEL 32 minis are 32-bit machines with 64K words of memory each and have 40M bytes of disk, magnetic tape, a card reader, line printer and a Teletype input, Mann said.

The CRT console is located in a room above the surface on the bridge. Two operators monitor the status of the operation and only make changes when something is not quite right.

"If everything goes all right, the peripherals are not used" with the exception of the disk drive and the printer for necessary operations, he noted.

The second on-board minicomputer will be used as a backup system in case of failure and by shipboard personnel for off-line computations on other aspects of the barge's operations, he explained.

Benchmark Decides Vendor

The firm considered several different vendors and both 16-bit and 32-bit machines before deciding on the SEL system, Mann said.

The final decider, besides price, was a benchmark test. A criterion for the system was that programming could be done in a high-level language.

The SEL system performed well on the Fortran benchmark and, because the 16-bit machine would have to go to double precision, cutting into the system's accuracy, the SEL system was chosen, Mann said.

He added that the analog-to-digital converter and other gear necessary for the operation was supplied by SEL, making "the hundreds of inputs and outputs that have to be coded and converted" in a system like this more easily interfaced.

Cabinet Maker Using Portable CPU to Solve Estimating Problems

ENUMCLAW, Wash. – The dual problems of managing growth and increasing product quality in the casework and cabinetwork industry are being solved at Ly-Line Products, Inc., here with a new, portable computer, according to the user.

"We are using our new computer, an IBM 5100, for job estimating and soon will use it to relieve product engineers of tedious, repetitious manual design calculations," Hugh Lyman, president said.

The five-year-old, $2 million-per-year company tailors its products line to the specific needs of the school, university, hospital, office or institutional use its customers define.

"Precise estimating is an absolute necessity," Lyman said. "There are more than 30,000 possible sizes, styles, types and models in our line.

"And, despite constant fluctuations in labor and material costs, we must respond to bid opportunities with the most precise, timely and accurate information we can prepare."

The bulk of Ly-Line items are made of particle board laminated with high pressure plastic surfaces and plastic polymer edgings. The resulting assemblies are used in cabinets, counter units, multiple-user drawer storage units, files, shelves, screens and mobile cabinets.

"Product engineering is a second vital area in our business," Lyman observed.

"Mistakes have a direct bearing not only on profitability but also on the amount of money we have to invest in raw material and work-in-process inventories.

"We are developing our engineering program carefully so that we use the computer to calculate those elements of a build order which are standard, but leave to our engineers the calculation of nonstandard, one-of-a-kind requirements."

Ly-Line is located in suburban Seattle but markets its products nationwide.

Profligacy repealed:

Read our special report on Supplies and Security in the September 27th Computerworld.

Harry S. Truman, in his oft-quoted phrase on our improvident ways, admonished us to "Use it up, wear it out, make it do, or do without." As much as it made sense to the sugar-saving housewives of 1946, that wartime motto is excellent advice for the computer rooms of today. Our September 27th supplement, titled *Supplies and Security*, takes that advice, and we'll show you some innovative ways to save money by conserving supplies.

Edited by Drake Lundell, this Supplement will cover all the things you feed your computer system, including tapes, disks, cards, paper and forms. Miniaturization of the supplies you use has the added benefit of saving storage space as well as using less material -- and this supplement will examine equipment that does this, such as computer output microfilm and photo-reducing copiers.

We'll also address the subject of security in this report. Diabolical threats like dust, excess humidity, fires, floods, theft or sabotage could bring your computer operations to a grinding halt. We'll review the risks -- especially in the area of physical security -- and report on ways you can reduce your exposure to them.

Anyone who manages computer systems will find important and useful information in our September 27th supplement. And if you're a marketer of computer supplies or security products or services, you should advertise them here. Ad closing date is September 10th. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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University Finds 'Big Name' System Not Needed

By Esther Surden
Of the CW Staff

NEW HAVEN, Conn. – The University of New Haven and its students are doing very well, thank you, without a big IBM 370 or any other "name" system, according to Dr. Edward D. George, director of the computer center there.

"I don't like to put a name on the computer, because everyone then says, 'That's not an IBM shop.' We've tried to make it clear, and have been proving, that it doesn't *have* to be an IBM 370 or any other particular kind of computer as long as it functions to allow us to teach competitively."

And the minicomputer system at New Haven has done just that, George said, as witnessed by the jobs the university's graduates are getting.

Meta 4 System

The university has had a Meta 4 system from Digital Scientific Corp. for two years; it obtained the system as an upgrade to an IBM 1130 the university was previously using.

The system was chosen because the school wanted to easily upgrade without rewriting its Fortran programs. It also wanted a system that could support both batch and time-sharing.

Although the university looked into upgrading through IBM, an association was developed between the school and DNA Systems, Inc., a software house that specializes in upgrading IBM 1130 software. That association led the school to the Digital Scientific system, George said.

The Meta 4 has 64K bytes of memory; six on-line disk drives with 20M char./pack; a fixed-head swapping disk; two tape drives for backup; an IBM card punch; two card readers; two 600 line/min printers; four data sets; four CRTs; three hard-copy Digital Equipment Corp. Decwriter terminals; three Texas Instruments portable terminals; and a plotter.

The configuration costs about $7,000/mo on a third-party lease, George said.

DNA, IBM Software

The university has purchased most of its software from DNA but has IBM's Cobol package as well. Hardware maintenance for the Digital Scientific system is coordinated by that firm, although the disk drives are from California Computer Products, Inc., which handles maintenance on them, he noted.

Thus far the system has been very reliable, George said.

Both academic and administrative work are performed on the system. "We deal with all of the financial work that is done by the business office, such as payroll and accounts receivable and payable," he said.

"We also do financial aid records for all students who are given aid through the financial aid office; we take care of admissions records of new students and we maintain a data bank of the presently registered students to allow us to run class rolls and accumulate statistical data on students," he added.

The system also performs scheduling and student billing and prepares alumni office letters and mailings as well as reports on attendance, he said.

The Meta 4 allows two simultaneous batch operations to be run and also has the capability of accommodating 16 terminals on-line, George noted.

About 650 students learn computer programming on the system each semester, George said. "Some of our students are going after a business degree, but most of them are in the business administration area or are studying criminal justice or engineering."

They take Fortran, Cobol and a subset of PL/I. The school can also teach APL, Basic or its own Assembler, he added.

The system is "up and running all the time," George noted, because even though the center closes down at 11 p.m., the students have access through remote terminals.

The mini has improved the ability of the university to make decisions. It has generated management reports that have been very helpful, George said.

Multiuser Software Runs on DEC Minis

MAYNARD, Mass. – Digital Equipment Corp. has introduced several hardware configurations which allow the PDP-15 and XVM systems to accommodate its Multiaccess software package.

Multiaccess is a multiuser version of Digital's XVM/RSX software system.

Up to six concurrent users can now be accommodated by the PDP-15 or XVM and as many as 16 terminals can be added to the systems depending on the amount of system memory and disk storage space available.

Existing RSX users can license Multiaccess for $2,750; Multiaccess for XVM systems costs $6,000.

Prices to expand PDP-9 and PDP-15 systems to XVM Multiaccess very according to hardware configuration, DEC said from Maynard, Mass. 01754.

Turnkey System Cuts Manufacturer's Costs

(Continued from Page 33)

why I wanted to computerize, I probably would have said for order entry, to eliminate the huge duplication of paperwork we were doing," Chalfin continued. "But we're getting a great deal more than we ever thought we would.

"By computerizing, we have significantly affected the thinking of middle and top management. We find that we have taken a much more disciplined approach to the entire business operation.

"Today, we know a great deal more about the intricate workings of our own company and detailed data like the profitability of a single product," he remarked.

Acquisition Unit Links to Mini

WORCESTER, Mass. – Micro Networks Corp. has a miniature data acquisition system which it said can bus directly into a minicomputer line.

The buffering of selected outputs with tristate gates allows the data acquisition system to interface directly with microprocessors and minicomputers, the firm said.

The MN7002 16-channel, 12-bit system is expandable to 256 channels, a spokesman noted.

The unit costs $495; a military temperature range version costs $865, Micro Networks said from 324 Clark St., Worcester, Mass. 01606.

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Distributed Mini Net Boosts Energy Production

CALGARY, Alta. – By controlling the flow from more than 50 natural gas wells to two processing plants with a four-minicomputer distributed network, one of Canada's energy producers reported savings and increased production.

The system at Hudson's Bay Oil and Gas Co. Ltd. (HBOG) here manages, monitors and controls the flow rates from wells located 350 miles from the Calgary head office and central computer.

Currently, a second field system, which is over 850 miles from Calgary, is undergoing final testing prior to being incorporated into the computer network.

Studies are also in progress to add a third field to the expandable network.

Based on operation at one field over the past two years, the Hewlett-Packard Co. (HP) 9700 distributed system has accounted for a production increase of 1.5%, savings in overtime labor costs and increases in the proportion of valuable liquid natural gases produced, according to HBOG. Additional fuel gas savings of up to $20,000/mo have been accrued from temperature control of the fluid streams produced by the wells.

"The distributed network system provides us with a flexible and expandable system at a moderate price," Art Wichert, superintendent of automated systems for HBOG, explained.

"Eventually, we may have a number of process control computers in field areas serviced and backed up by one central communications computer."

The distributed system consists of a supervisory central communications computer (CCC) located at the company's headquarters here. The CCC employs an HP Real Time Executive RTE-II operating system. The CCC collects field production data for management review, acts as a communications central for messages and interrogates field systems upon demand by users.

It also is used for software development and is available to back up the field process control computer (PCC) satellites.

The PCC systems are located in the field areas and operate under HP RTE-II operating systems also. Communications between the CCC and the PCC computers take place over telephone lines. The PCC contains all the application programs which are responsible for printing alarms, reports and issuing control setpoints or choke valve opening positions of the well.

The PCC systems have, as slaves, HP processors called Computer Satellite Units (CSUs). They are at the lowest level of the distributed systems hierarchy and are used for data samples and reduction as well as for maintaining the setpoints called for by the PCC.

HBOG has one field operating system located at the company's Kaybob South gas field about 350 miles north from Calgary in Central Alberta, while the other system is located at Zama, an oil and gas field 850 miles away in Northwestern Alberta.

The PCC systems, both Hewlett-Packard 9640 data acquisition and processing systems, monitor plant and field operating conditions and check for abnormalities. They also calculate flow rates for individual wells to meet operating plant requirements. These flow rates are then communicated, in the case of Zama, to the HP CSU which assures that settings on each well's choke valve are maintained.

At Kaybob, this same valving control function is performed by 11 "smart" remote terminal units (RTUs) directly connected to the PCC. The RTUs are 4K computers responsible for data collection, choke control and conversion of sensed signals to engineering units.

Arranged in this way, the distributed system for controlling and monitoring the gas and oil fields and processing plants serves all levels, from management to field operation and maintenance. System backup in the case of failure is accomplished by transferring control to the next level of computers.

Each computer is capable of operating independently and sharing the load as needed. Peripherals can be shared and the system offers backup redundancy, he added.

Prior to the installation of the supervisory control system, flow rates on individual wells had to be adjusted manually by operating crews each time the plant required a flow change. The crews would travel through the gas field and adjust flows on a sufficient number of wells to meet the requested change.

In addition to flow adjustments, the operating crews had to visit well sites on a daily basis to check for equipment malfunctions and obtain data for operating reports.

Operating conditions monitored by temperature and pressure sensors now are transmitted to the remote terminal unit (RTU) at the well site, through a multiplexing device, an analog-to-digital converter and (at Zama) the HP 2100 CSU slave computer before finally arriving at the HP 9640 PCC system.

Scans of the sensors are made every three minutes, or more often if necessary. At these intervals, the flow rates are calculated. A flow rate program calculates the current cumulative flow rates of all wells and compares this figure with the desired plant inlet rate which has been entered by the system operators.

If the desired rates and current rates are different, the flow program calculates new flow setpoints for each of the wells and sends these new well setpoints to the CSU which controls the field chokes.

The Zama system will utilize a 32K HP 2100 slave processor called the Computer Satellite Unit to handle data manipulation between the PCC and the field RTUs. Production control panels and two teleprinters will allow operators to access data and reports while allowing total field rates to be controlled as desired.

The Zama or Kaybob PCC can be backed up in Calgary by using the last data base transmitted (less than 24 hours before) and activating either Zama or Kaybob operating programs.

In the field, the PCC could be by-passed or, if the CSU failed, the PCC could be converted to a CSU. Operating control would, therefore, be transferred to Calgary but reports could continue to be sent to the user's terminals in the field upon request.

Management Statistics Provided

One of the roles of the central HP 9640 CCC system is to gather production and accounting reports from the PCC field systems for supervisors, analysts, technical staff as well as maintenance and operating personnel in the company.

Daily and monthly production volume statistics are forwarded to the central Calgary computer. These statistics are also available from any of the terminals on the system. Other reports, tailored to any particular user, are provided, such as well summaries, average operating conditions, plant operating reports and supervisor's reports.

Communications between these field computer systems and the central system here takes places over dedicated leased telephone lines.

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"I considered this to be a very good fundamental review of basic problems associated with EDP contracting."
J.M. Aubry, Canadian Government

"This was an exceptionally well organized seminar. The material presented was significant and useful. This seminar would be of great practical value to someone without computer contracting experience as well as serving as a useful outlet and review for those with more background and experience."
William C. Prinn, Director, Advanced Planning
Chessie System, Baltimore, Md.

"I had no idea that we would have the opportunity to communicate so closely on an informal basis. That, combined with your excellent preparation, made this experience the most rewarding seminar experience I've had. I commend you for what I regard as a most worthwhile seminar, and thank you for your genuine interest in communicating with, and not merely to the participants."
SV, Attorney, Worcester, Mass.

"The appropriateness of this seminar is extremely important. This area of the Computer Science field has generally received little or no attention from user, vendor or the legal professions."
D.J. Connelly, Development & Control Manager
Norton Company, Worcester, Mass.

Roy N. Freed is the Seminar Leader

Roy N. Freed is internationally known for his acuity and expertise in this field, and he will personally direct the entire seminar. A graduate of Yale Law School, Roy has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private corporate practice in greater Boston with the firm of Pollock, O'Connor and Jacobs. He teaches at Boston University Law School, and has written many articles on this subject, including "Computer Fraud, a Management Trap" (Business Horizons), and "Get The Computer System You Want" (Harvard Business Review). He is the author of the book, *Computers and Law — a Reference Work*, now in its fourth edition, and he also edited the complete, extensive course materials used in this seminar.

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CI Notes

IBM Documents Not Admitted In West Coast Lawsuits

LOS ANGELES – Although a passel of documents have been turned over to the court in the U.S. vs. IBM antitrust case by order of Judge David N. Edelstein, these same documents are still considered privileged in the upcoming trials being pressed by West Coast firms against IBM.

Judge Ray McNichols told a pretrial hearing here he does not agree with the standards used by Edelstein and therefore did not order these documents to be submitted, sources said.

In another move, California Computer Products, Inc. (Calcomp) is dropping claims of damages by IBM to the tape drive sector of its business.

Calcomp will be the first of the several plaintiffa to try its case against IBM in a jury trial scheduled to start Nov. 8

Calcomp attorney Max Blecher indicated the move was an "accommodation to the shortness of life," adding it "seemed prudent to narrow the case down."

Observers expect the Calcomp trial to have a duration of four to six months.

Police Find Xerox Parts at Valcomp

LOS ANGELES – Printed circuit boards worth $8.7 million that were discovered missing from Xerox Corp. here in March turned up at Valcomp Co. during a search in early July by police.

Valcomp, a subsidiary of Tymshare, sells add-on peripherals and spare parts to Xerox users, among others.

No arrests have been made. Valcomp, Tymshare and Xerox spokesman had no comment on the situation.

Iomec Moving to Minnesota

MINNEAPOLIS – In yet another centralization move, Data 100 Corp. plans to pull its Iomec operations closer to home to a plant in Minnetonka, Minn., and close its current facility in Santa Clara, Calif., by Jan. 1.

The decision to move Iomec was based on revised marketing forecasts and potential cost savings in the smaller Minnesota facility, according to Thomas G. Herschbach, group vice-president.

The transfer affects 180 employees at the Santa Clara plant, a number of whom have been offered jobs elsewhere in the company, a spokesman said.

The firm transferred its minicomputer manufacturing from Santa Ana to Minnetonka last January.

In May, Data 100 sold Iomec's paper tape and magnetic tape cartridge product lines, leaving Iomec with disk production.

Amdahl, IBM Cross-License Patents

By a CW Staff Writer

SUNNYVALE, Calif. – Industry observers have been wondering what IBM's reaction would be to the upstart challenger Amdahl Corp., which has been making some inroads in IBM's 370/168 territory.

The most notable – although hardly noticeable – action so far has been a recently negotiated broad cross-license agreement on patents between the two firms.

The agreement, which came to light in a prospectus Amdahl filed with the Securities and Exchange Commission, is included in a list of licensing agreements with other companies, principally Fujitsu.

"IBM and Amdahl have entered into a nonexclusive worldwide patent cross-license agreement for the field of information-handling systems," an IBM spokesman said.

"The agreement requires no royalty payments from IBM and establishes an initial front-end royalty credit for Amdahl. After the credit is exhausted, Amdahl will pay royalties to IBM if its usage of IBM patents exceeds IBM's usage of Amdahl patents," IBM said.

"The fact is that in order to legally sell [the Amdahl 470V/6], Amdahl must have a license from IBM. So [it] came to us and we negotiated on the basis of present value. The terms of the agreement reflect that," an IBM spokesman added.

There is compensation for Amdahl in the sense that it gets credits from Amdahl patents which IBM uses, and Amdahl therefore only pays to the extent that its use of patents exceeds IBM's, he explained.

While noting the terms of the agreement might be beneficial to IBM in the future if it decides to use Amdahl technology, "the fact is that [Amdahl is] a new company, it's just starting out and needs our licenses, so it came and got them. And that's something that's negotiated on the basis of present value. That's a fairly typical arrangement," the IBM apokesman said.

Under the IBM-Amdahl agreement, signed in May and retroactively effective to June 1, 1975, each granted the other license as to its patents issued and to be issued pursuant to applications filed prior to July 1, 1980.

The agreement covers substantially all patents relating to computer systems held by each party, except for cosmetic design patents.

"The agreement covers both hardware and software to the extent the latter may be patentable and covered by the patents" for the lives of the patents, the Amdahl prospectua said.

"The agreement provides for royalty payments to IBM based on various formu-

(Continued on Page 40)

Study Finds Strong Interest In EFT by Financial Houses

By a CW Staff Writer

ATLANTA – Eighty-six percent of large banks' marketing executives expect their institutions will offer debit cards by 1980, according to a survey of financial service institutions (FSIs) conducted by the Payment Systems Research Program (PSRP), a subscription research program of Payment Systems, Inc.

Other optimistic opinions about the future of electronic funds transfer (EFT) systems were uncovered by the study which aurveyed the 500 largest commercial banks, 200 largest savings and loan associations, 100 largest mutual savings banks and 175 large credit unions.

Approximately 75% of all FSIs with over $1.5 billion in deposits and 60% of those with over $500 million in deposits responded.

The survey found a favorable climate among FSI marketing executives for the introduction of EFT systems, with most stating they plan to participate in some sort of EFT program within the next several years.

FSIs' interest "stems primarily from a desire to maintain or improve their competitive position in the marketplace," the report stated.

"While they are aware of consumer concerns and not particularly satisfied with their present advertising efforts, they are spending a relatively limited amount of money on research into consumer marketing of EFT," PSRP said.

ATM Rise Forecast

Ninety-three percent of bank marketers surveyed predicted their institutions would have automated teller machines (ATMs) by 1980.

Although only 20% of the savings and loans and mutual savings banks surveyed have ATMs now, 86% forecast adding them by 1980.

Only about 5% of FSI marketers believed their institutions would not participate in merchant point-of-sale terminals within the next five years, while about 60% believed consumers will view the convenience of EFT terminals at retail store locations as a major benefit, the PSRP survey found.

A majority of respondents – 55% of banks and 51% of thrifts – agreed EFT systems will improve the profitability of consumer financial services, PSRP said.

Finally, only 23% of the marketers at high branching banks (those with more than 10 branches) and almost 46% of marketers at high branching thrifts expect to add more than 10 branches by 1980, the survey found.

Market Share Changes Forecast For Data Acquisition Subsystems

WELLESLEY HILLS, Mass. – Although systems houses specializing in data acquisition subsystems can expect increased revenues between now and 1980, they will lose market share, according to a report from Venture Development Corp. (VDC), a market research firm here.

OEMa and end users capable of developing their own subsystems are bypassing the systems houses, and this trend could prove disastrous to systems houses unable to adapt to a more sophisticated marketplace, VDC said.

In 1975 systems houses accounted for 62% of the total $81.9 million world market for data acquisition subsystems, according to VDC.

By 1980, both salea and units to systems houses will fall below the 45% level.

While OEMs accounted for 25.3% of the market in 1975 and end users for 12.7%, their shares will grow to 35.5% and 20.5% respectively by 1980, VDC said.

Despite the decline in market share, VDC predicted continued growth for syatems houses, although at a slower rate than that of the total subsystems industry.

While shipments to systems houses will increase in value at a compounded rate of 8% between 1975 and 1980, the total world market for subsystems will increase at a compounded rate of 15.7%, VDC noted.

In terma of units, the firm predicted shipments to systems houses will increase at a 14.3% rate, while overall shipments will grow at a 22.5% rate.

"Chief among the factors contributing to this differential is the increased sophistication of components," VDC stated. "Subsystems that once consisted of racks of discrete components now are available in hybrid IC packages.

"As a result, OEMs and end users now find they can fill many of their simpler data acquisitions requirements with inex-

(Continued on Page 40)

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Varian Targets Commercial Area Needing Distributed Processing

By Esther Surden
Of the CW Staff

IRVINE, Calif. – Varian Data Machines, known for its scientifically oriented minicomputers, is diving head first into the commercial distributed processing marketplace with emphasis on real-time transaction processing, according to its president, Dr. Donal B. Duncan.

The firm is reaching out to customers in commercial areas. "The most active interest is in banks," he said in a recent interview here.

Most of Varian's business presently is in the real-time scientific areas with system houses and end users taking significantly smaller portions of the firm's business dollar, Duncan said. Continued emphasis will be placed on the scienfitic marketplace, he noted.

The firm's thrust is to sell its V70 series system to the sophisticated user. "We sell a good computer and a good system. We don't say 'Here's a turnkey solution'; we sell [users] the tools they need, definitely not just the hardware but the system software as well," Duncan said.

"We have picked out the area of providing hot hardware and hot software, and as given it is a narrowly defined area," he continued.

The market for that kind of business is $175 million, he projected. Varian is a $50 million dollar company in terms of sales volume, he said.

"The trend is toward the commercial use of minis. The major factor minis have now is software capabilities in data base management," he said.

With the data base management now available on Varian systems, the firm has the ability to go toward distributed processing systems, Duncan said.

"Distributed processing systems are now about to honestly occur," he said, adding the first people to implement them will be "very large and sophisticated users.

"The thing that is unique is that data base is getting into the minis," he added.

Of course, this means a thrust toward communications development, he said.

The first major test of the Varian distributed processing capabilities will come when Varian creates a network in its offices in Europe.

Amdahl, IBM Have Licenses

(Continued from Page 39)

las which, for machines sold, will not exceed .4% of the selling price. No royalty payments are made by IBM, but Amdahl's payments may be reduced to the extent of IBM's usage of Amdahl's patents.

"No royalties are payable by Amdahl until the total sales value of appartus utilizing IBM's patents delivered by Amdahl reaches $190 million," the prospectus stated.

Amdahl has filed 30 patent applications in the U.S. and more are being prepared. In addition, Amdahl and Fujitsu have each licensed the other under certain of their respective patents and technical information.

"The Amdahl-Fujitsu licenses are subject to any preexisting licenses from either party to any third party and are also subject to the right of either party to enter into a cross-license with a third party to avoid infringement of the patents of any such third party," the prospectus noted.

Fortune Lists Philips at Fifth Of Largest Companies Outside U.S.

CHICAGO – Germany's Philips Gloeilampenfabrieken ranked fifth in *Fortune Magazine's* listing of the 500 largest industrial corporations outside the U.S.

Three of IBM's foreign-based operations made the list, with IBM Deutschland garnering 99th place.

In a separate list, *Fortune* ranked IBM as 11th in terms of the 50 largest industrial companies in the world.

On the list of 500, Germany's Siemens came in 14th, down one place from last year, with sales of $7.7 billion. Philips' sales figure for the year was $10.7 billion.

AEG-Telefunken of Germany was 29, while Matsushita Electric Industrial of Japan was 32.

France's Thomson-Brandt rose 15 places since last year to 68.

Following IBM Germany's lead, IBM France rose 28 places to 124 with sales of $1.7 billion, compared with the German firm's $2 billion.

Nippon Electric was listed as 131, Schlumberger of the Dutch Antilles was 137, Britain's Rank Xerox was 152 and Italy's Olivetti was 163.

Fujitsu retained its last-year's rank of 229, while IBM UK squeaked ahead five places to 237.

Honeywell Bull, which did not make the 1974 list, was ranked 318. Britain's International Computers Ltd. also made the list this year as 364.

Subsystem Shares to Change

(Continued from Page 39)

pensive, off-the-shelf, modular/PC board and IC data conversion circuits," VDC continued.

The availability of low-cost intelligence must also be considered an important factor in the future, VDC stated, noting however, that in the long run this development should be beneficial to systems houses.

Of eight types of subsystems explored, VDC predicted the market for intelligent data acquisition subsystems will expand the fastest in both revenues and units between now and 1980, with shipments rising at a rate of 28.5% yearly and annual sales reaching $24.3 million.

Closely related to the class of intelligent subsystems are communications-oriented subsystems, currently the largest subsystems segment (22.9%) in terms of revenues and expected to retain this dominance through 1980.

VDC predicted that by 1980 it will be impossible to distinguish between intelligent and communications-oriented subsystems since the "intelligent subsystem will have communications capability and the communications-oriented subsystem will be 'smart.' "

Other classes of data acquisition subsystems expected by VDC to show significant revenue increases are modular subsystems, data loggers and subsystems for temperature sensing.

Sales of "standard" subsystems, subsystems for data display, and scanners/multiplexers are expected to remain relatively flat throughout 1975-1980.

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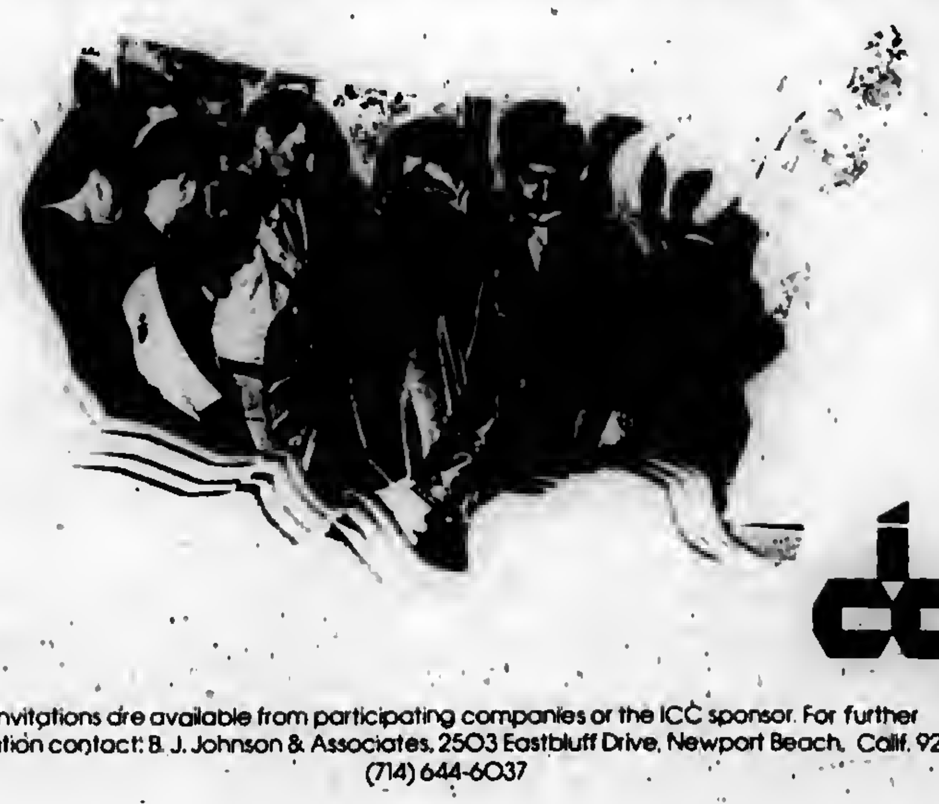

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Makes Fourth Upgrade

DP Center Growing at Saudi University

By Peter Fingar
Special to Computerworld

DHAHRAN, Saudi Arabia – Both a new computer and a new director were installed recently on the sands of Arabia.

The new computer is a 3M-byte IBM 370/158 that replaced a 370/145. The new director of the Data Processing Center (DPC) is Ahmed Al-Sari.

The DPC, located at the University of Petroleum and Minerals, is one of the major computer facilities in the Middle East.

The hardware change represents the fourth major upgrade since the first computer was installed in 1967, an 8K IBM 1130. The 1130 was used for basic administrative applications with no initial faculty or student use.

Because of the importance of the DPC to the whole of Saudi Arabia as well as the university, a "service bureau/university computer center" venture was embarked upon and an IBM 360/50 was installed in 1969 as an addition to the 1130.

International News

The venture was successful and computing demand grew from within the university and external users. In order to keep pace with the demand, an IBM 370/145 displaced both the 1130 and 360/50 in 1972.

With the installation of the 370/158, the present configuration includes an IBM 2501/1403 batch station and 28 IBM 029 keypunches in the main student input/output area.

Administrative data processing and the systems engineering departments are serviced with two IBM 3780 remote batch stations, 10 IBM 2741 interactive terminals, an IBM 3881 optical mark reader unit and five IBM 3742 key-to-diskette units.

Student works with 3742.

Saudi student is engrossed in maneuvers on CRT.

This system is operating under OS/VS1 with Tone support for the 2741 terminals. Student jobs are run using Watfiv and Watbol batch compilers.

In addition, several scientific computing packages are used extensively. These include CSMP, HIDES, Ices, Dynamo, SSP, Omnitab, Chess, SPSS and Ecap.

The growth in hardware has been matched with a growth in applications. The administrative data processing provides a large number of services to the university administration.

The College of Engineering, for instance, makes extensive use of the DPC in support of its systems engineering and general engineering curriculums. The College of Industrial Management introduced a new bachelor degree program in information systems and an Educational Services Group within the DPC serves the DP training needs of the kingdom.

External users from government and private sectors account for about 50% of present system utilization.

Funded by the government of Saudi Arabia, the university received about $95 million for its operating and capital expenditures budget.

The university offers basic science and engineering courses leading to bachelors and masters degrees. There were 1,600 students enrolled in June.

Students' expenses are fully covered and they are paid monthly stipends.

Fingar, an educational specialist at the University of Petroleum and Minerals, teaches a DP training course and serves as a systems analyst.

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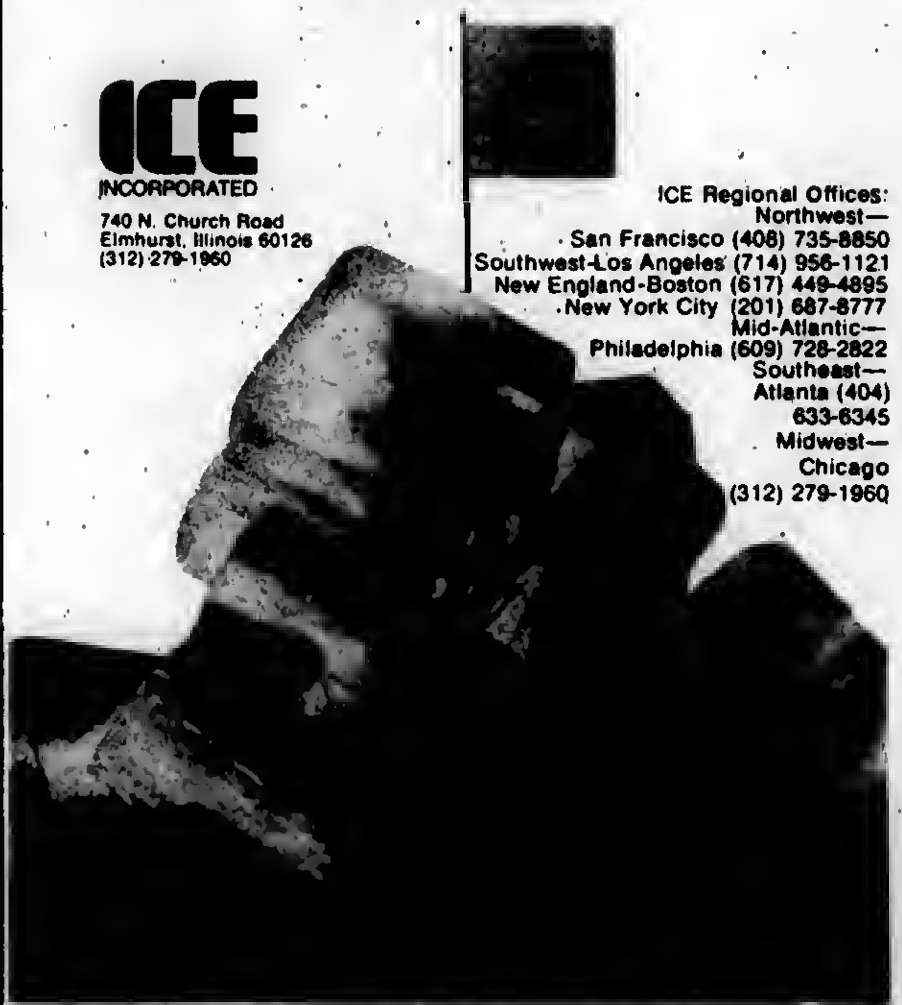

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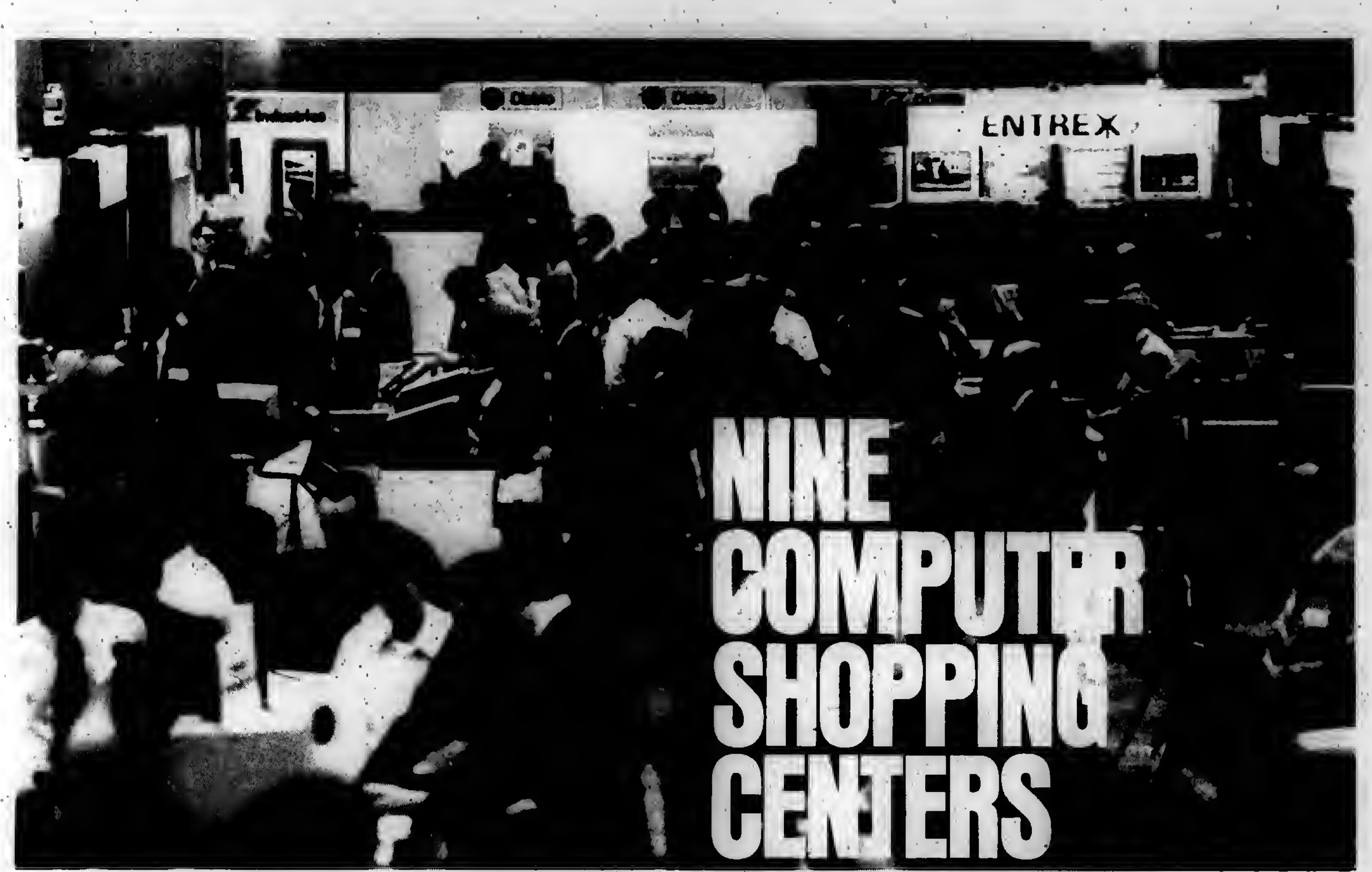

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Philadelphia	May 24-26
Washington, D.C.	May 31-June 2
Boston	June 7-9

Exhibitor Participation Plans

There are several ways for you to participate in the 1977 Caravan, and you can choose the one most suited to your company's marketing needs. Most Caravan exhibitors get complete, national coverage with our full-tour, standard booth and complete package of support services. OEM exhibitors—or those who wish to cover major cities only—can exhibit in our Major City/OEM tours with a standard booth and complete support package. The five cities in the Major City/OEM tours are San Francisco, Los Angeles, Chicago, New York and Boston.

If you don't need a full booth to tell your story, then the minibooth is available at a mini price. The minibooth comes ready for participation in the Full Tour and the Major City/OEM Tour with a complete package of Caravan services. The minibooth offers you a unique advantage: it does not have to be manned in every city. So you get personal contact selling where you need it, and a travelling billboard where you don't. In the un-manned cities, the Caravan staff will stock your exhibit with your literature and sales aids, then collect inquiry cards from interested attendees and forward them on to you. Attendee-activated or continuous loop slide or film programs can be used to highlight your sales message in a graphic and memorable way. In those cities where you have field sales staff, they can man the exhibit and get the full benefit of face-to-face Caravan contact.

The Caravan Support Team

We've formed a special Caravan support team to make it easier than ever for you to be part of Caravan 77. They will help you clarify your objectives and expedite the details involved with your participation. They can give you expert advice on everything from designing your graphics to integrating the Caravan as a high performance tool in your overall marketing plans. An Account Executive from the Caravan support team will be available to work with your sales and management staff as soon as you've returned our Caravan Exhibit Space Reservation Agreement. So it'll pay you to sign up soon. Make the Caravan 77 a powerful accelerator of your market penetration next year.

For complete details on Computer Caravan 77 and an Exhibit Space Reservation form, send in the coupon below. Or call our National Sales Manager, Roy Einreinhofer, at (617) 965-5800.

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Maker of Programmerless System Eyes Rapid Growth

By Esther Surden
Of the CW Staff

BURLINGAME, Calif. – What hath John Peers wrought?

He calls it Adam, a small business system designed for unsophisticated small business users. He also calls it a "lomac," or logical machine.

And the name of his company? Logical Machine Corp., of course.

Peers' goal is to "put machines back in the hands of the people," he said in a recent interview here, because in the next several years "we may end up with a computer that costs $300/year. How can we justify a programmer at $40/hour when you're paying $10/month for the system?"

The firm, incorporated in 1974, shipped 71 Adam systems as of Aug. 12, Peers said. Seventeen dealers, both foreign and domestic, sell the systems.

Peers predicted rapid growth for Logical. "We will ship 250 systems in the next year and 600 more in the following year," he said; "because the user doesn't have to hire two programmers for every machine we sell."

Peers also expects a price erosion in Adam's price. "In two years' time, the system may cost $20,000, not $40,000," he said.

Why Programmerless?

Why a programmerless system? What are the qualities of a programmer's job? Peers replied. A programmer must be logical, capable of never being bored, deal with repetition and like detail while at the same time maintaining accuracy, he said.

"The reason we have so many problems with software is that no one has thought that it could be generated by a computer," Peers explained.

Adam "learns" the meaning of new words in terms of previously learned words and is "taught" the difference between verbs, nouns and structures via the keyboard, Peers said.

Another advantage of Adam, Peers said, is its flexibility. The user can change his mind in the middle of programming an application if what he is getting is not what he wants.

Normal systems take a long time to be revised, he said; with Adam, the user isn't locked into one particular way of doing things.

"After all," Peers said, "the solution to a problem changes the problem."

Adam is aimed at small businesses with anywhere from $500,000 to $50 million in sales, he said. Logical has a policy not to sell to any firm with a higher volume than that because it would not be happy.

Adam has a 40% referral rate, Peers said.

New Systems

Joining Adam's family by the end of the year will be Adam Junior and Adam Senior, Peers said. Adam Junior will contain a minicomputer, floppy disk, 30 char./sec printer, keyboard and CRT for less than $20,000.

Adam Senior will have a range of disks from 24M to 100M bytes, a keyboard, screen, twin floppy disks, Adam logic and a 300 line/min printer, Peers said.

The system will also have the ability to communicate to other Adam systems, but not until six months after its introduction, Peers said. Thus multiple Adams will be available for distributed processing applications, he said.

Facsimile, word processing and other unique applications will all merge on one system in the future, Peers predicted, and the time is not far away when a machine will be produced that the user can talk into and modify.

A Reality Tomorrow

The industry predicts, on a straight-line basis, but invention isn't on a straight-line basis, he added. What sounds like science fiction today may be a reality in the future, he said.

With the IBM 3s, 32s and 5100s, IBM has "endorsed the fact that at that point in a business you can have a legitimate computer," and it has in effect boosted the market for small systems, Peers said.

John Peers

"The major problem with dealing with us is our stability," Peers said frankly. "You've got to try" to make people believe that you are here to stay, he said.

OEM Conference Set To Start Tour Sept. 8

NEWPORT BEACH, Calif. – The Invitational Computer Conference (ICC) will open its nine-city 1976-77 tour in Newton, Mass. on Sept. 8

The one-day conference is aimed at OEMs and will feature product introductions and displays by 30 manufacturers as well as eight product seminars of interest to OEMs, sophisticated end users and system house attendees.

Other cities on the schedule are Chicago; Minneapolis; Dallas; Orange County, Calif.; Ft. Lauderdale, Fla.; Palo Alto, Calif.; Hempstead, N.Y.; and Philadelphia.

Further information is available from the ICC sponsor, B.J. Johnson & Associates, at Suite 204, 2503 East Bluff Drive, Newport Beach, Calif. 92660.

Medical Mart to Grow 19%

WETHERSFIELD, Conn. – The medical computer market is experiencing a steady compound annual growth rate of 19% which will result in growth from $170 million in 1974 to $450 million by 1980, according to a report by Theta Technology Corp.

Accounting applications presently make up 65% of these DP systems, the report noted, but within a few years the main growth will be in turnkey services and mini-based computers.

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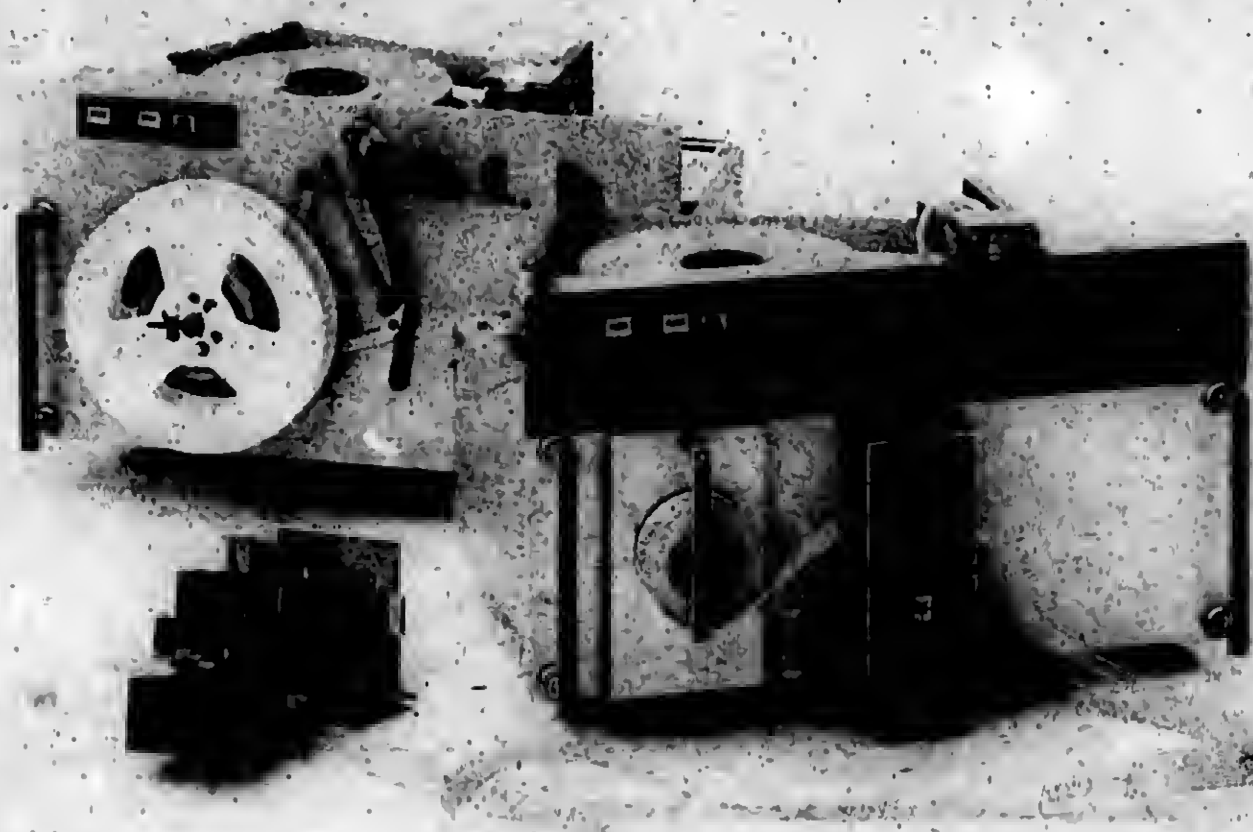

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National Tea Selects National Semi POS

SANTA CLARA, Calif. – National Tea Co. has ordered $6 million worth of Datachecker electronic point-of-sale (POS) systems from National Semiconductor Corp.

The agreement, which runs through September 1978, allows for installation of POS equipment in more than 100 National Tea stores. National Tea already has Datachecker equipment in more than 60 stores.

The equipment includes T-2500 stand-alone terminals with polling subsystems, scanning equipment and key-entry alpha systems without scanners, according to National Semiconductor.

Other O&I

U.S. Precision Lens is the first U.S. firm to install an IBM 5230 data collection system, according to IBM. The system will be used by on-the-job manufacturing workers to enter information from magnetically-coded badges into data-entry stations located in their work area.

Orders & Installations

The Associated Press has ordered Delta 4000 video display terminals from Delta Data Systems as part of a minicomputer-based disk operating system AP is installing.

Product Research Co. has ordered a Univsc 90/30 system to replace an NCR 200. The 90/30 will be used initially for order entry but will be implemented to control manufacturing operations.

Midwest Financial Management Corp. has installed a Burroughs B1700.

System Development Corp. has ordered 16 "Super Disks," large-capacity disk storage units, from Storage Technology Corp.

Columbia Newspapers, Inc. has ordered a 56-VDT composition/business system, including a Dymo/Xylogics copy processing system CPU 740 and a Data Processing Systems BPS 800 from Dymo Graphics Systems, Inc.

Erco, Inc. has ordered a second NCR Century 251 computer to support on-line processing services it offers to credit unions.

The Federal Trade Commission has ordered 22 Visual Type word processing systems from Daconics, a Xerox Corp. subsidiary, to form a regional communications network.

Durr-Fillauer Medical Inc. has ordered 10 NCR Century 8200 minicomputers, each with four visual display terminals. The firm also ordered two Century 101 computers, each with a minimum of 12 visual display terminals, for a computer network it is designing.

Pink Supply Corp. of Edina, Minn., has installed a Burroughs B700 system for performing budgetary operations.

TRW Earnings Up 31% in Quarter

CLEVELAND – TRW, Inc. reported sales for the second quarter were up 11% and earnings increased 31% over 1975 second period results.

For the second quarter, sales reached $743.8 million compared with $667.1 million for the year-ago period.

Earnings reached $37.8 million or $1.18 a share compared with a restated $28.9 million, or 88 cents a share a year ago.

Results for the first half showed sales reached $1.4 billion compared with $1.2 billion for the year ago period.

Perot Made Large Political Gifts

DALLAS – H. Ross Perot, chairman of Electronic Data Systems Corp., was the largest individual contributor to congressional elections two years ago, according to Common Cause, a citizens' lobbying group.

Perot contributed a total of $90,900. Of this figure, $63,000 went to democrats, $27,900 to republicans.

In a further breakdown, Perot contributed $28,500 to members of the House Ways and Means Committee and $26,000 to members of the Senate Finance Committee.

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Sales index of budget-cutters and non-cutters

	1968	1969	1970	1971	1972	1973
Maintained budgets in 1970 & 1971	100	118	123	135	156	200
Cut budgets in both 1970 and 1971	100	111	109	111	122	145

2. Your brand stands out.

A McGraw-Hill survey of their business magazine readership indicates that a company's advertising can affect a company's reputation. Some of the reader comments:

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"I feel that a strong ad indicates strong management."

"I buy from someone who advertises ...it spells quality to me."

3. Your salesmen stand out.

An article published in the Harvard Business Review ("Industrial Advertising pays off," Harvard Business Review—March-April, 1970) shows that sales costs are reduced when a strong advertising program supports a sales program. The total cost of selling to groups exposed to advertising often *drops* by 10% to 30%.

On the other hand, the non-advertiser stands at a serious disadvantage in a well-advertised market. His cost of selling to groups exposed to his competitors' advertising may actually increase 20% to 40%. This isn't a happy thought in times when you're selling less.

*For a copy of this study entitled "How Advertising in Recession Periods Affects Sales," send $1.00 to American Business Press, 205 East 42 St., New York, 10017.

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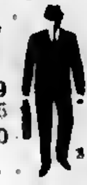

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SYS/PROG ANAL	20M
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Individual needed to work in systems design and programming applications to maintain a Manufacturing Data Base under DBOMP through CICS. Must be a self-starter with degree and two years experience with CICS coupled with knowledge of COBOL and DBOMP.

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Individuals will have 2-5 years COBOL programming experience coupled with a sound working knowledge of systems design. Must be self-starter and capable of working with a project team in all phases of systems development from problem solving and programming through implementation in a manufacturing environment. Experience in bill of material processing, material control systems or financial applications necessary. Knowledge of BAL and Mark IV a definite plus.

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Individual will possess a degree in computer science and have the ability to communicate and educate users on Data Processing related subjects as well as writing and maintaining data processing standards.

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To further explore these career opportunities submit your resume and salary requirements to:

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West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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Datapoint Corporation, a fast growing computer manufacturer, is seeking a qualified manager of sales training for its expanding national marketing group. This position requires an outstanding individual. Qualified applicants will have a relevant college degree, or the equivalent, plus 3 to 5 years industry experience.

Necessary skills include the ability to convert technical terminology to sales terms. Responsibilities will include development of programs for training of newly hired sales personnel and refresher courses for existing staff, plus the conduct of sales training courses for all levels of company personnel. Successful candidate will have excellent verbal and written communications ability, with a good grasp of business computer hardware and software concepts.

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SENIOR PROGRAMMER ANALYST

The successful candidate should have 5-7 years of general business knowledge with experience in COBOL, OS JCL, and IMS, as well as good communication skills. Knowledge of on-line order entry/inventory control would be a plus. Degree preferred.

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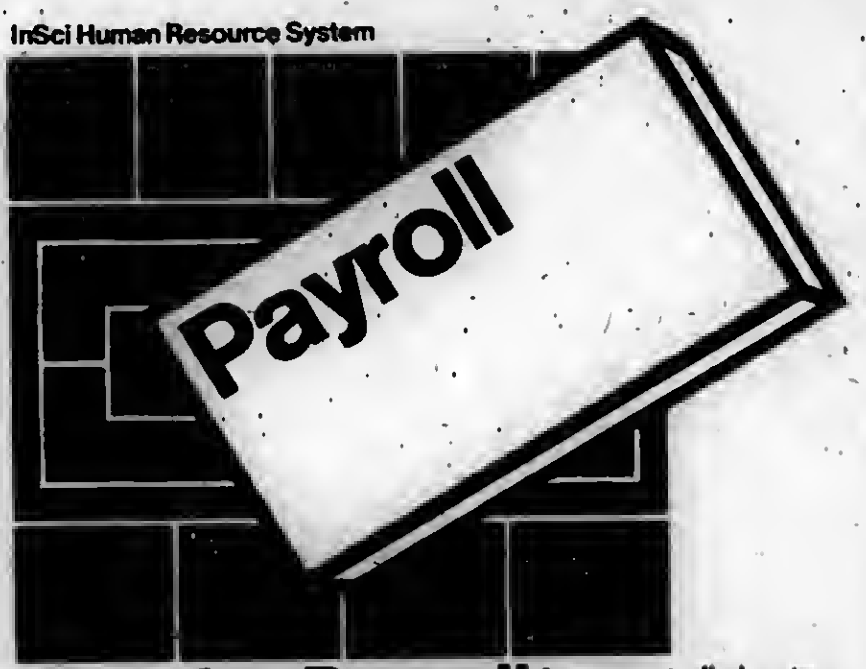

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HP Net Dips in Quarter, Nine Months

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) reported a 13% rise in revenues but a 9% drop in earnings for the third quarter ended July 31 compared with year-ago figures.

During the quarter, the pocket calculator business operated at a loss, according to William R. Hewlett, the firm's president.

"Third-quarter results have been disappointing," Hewlett said. "Our domestic business exhibited continued strength, but not enough to offset weakness in our international orders, which were substantially below target.

"It appears that achieving last year's level of income will be extremely difficult unless we experience substantial improvement in international markets during the fourth quarter," he added.

As a whole, incoming orders for the quarter rose 11% to $291.1 million compared with the same period last year. For the nine months, orders rose 12% to $841.8 million compared with that year-ago period.

Domestic Orders

Broken down into the domestic and international sectors, domestic orders for the quarter rose 18% to nearly $155.4 million while international orders increased only 4% to $135.7 million.

During the quarter, revenues rose to $277.5 million compared with $245.9 million in the same period last year.

Earnings, however, were off to $18.5 million or 65 cents a share compared with $20.3 million or 73 cents a share in the year-ago quarter.

For the nine months, revenues grew 12% to $792.9 million compared with $706.3 million in the same period last year.

However, earnings dropped 9% to $57.3 million or $2.05 a share compared with nearly $62.7 million or $2.27 a share in the year-ago period.

In the nine months, domestic orders rose 15% to $428.1 million while international orders rose 8% to $413.8 million compared with the year-ago figures.

"In addition to delays in introducing new pocket calculator models, severe price erosion in this product line, felt earlier in the U.S., occurred in international markets. This led to a significant decline in profitability of our Singapore operation, which in turn necessitated an increase in our overall projected tax rate," Hewlett said.

DEC Posts Record Year As Earnings Climb 60%

MAYNARD, Mass. – Digital Equipment Corp. managed to amass record revenues and earnings for the fourth quarter and year ended July 3, with earnings for the year reaching $73.4 million, up 60% over those of a year ago. Revenues rose 38%.

During the quarter, revenues rose 45% to nearly $232 million compared with $160.5 million in the year-ago period.

Earnings grew to $26.8 million or $2.11 a share compared with $17.4 million or $1.46 a share in the same quarter last year.

For the year, revenues rose to $736.3 million compared with $533.8 million last year.

Earnings totaled $73.4 million or $5.94 a share compared with $46 million or $3.85 a share last year.

The firm cited a number of factors in its strong performance: the availability of new computer and software systems, strong worldwide demand for products and services and the expanded use of manufacturing resources. Orders outpaced shipments throughout the year, it noted.

DEC plans to proceed with aggressive plant and personnel expansion, a spokesman said. During 1976 the firm added about one million square feet of space and plans to expand by two million square feet this year. Employment reached 25,000 people worldwide.

The company said it expects improving economic conditions will give it the opportunity to increase sales and earnings.

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"With Formstackers, we can now use the *full* capacity of our high-speed printers." —Mike Menditto, check processing manager, Bonkers Trust Company.

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Modcomp Dive in Second Quarter Results in Loss of $3.8 Million

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc.'s (Modcomp) results took a nose dive in the second quarter, resulting in a loss for the six months as well as the quarter.

For the second quarter ended June 30, the firm revealed a loss of $3.8 million or $1.37 a share, which includes $1 million in inventory write-down and $1 million inventory reserve, according to a spokesman.

The loss stemmed from much lower than expected shipments, higher than expected costs of goods sold and expenses as well as the inventory adjustments and reserves, the company said.

Revenues for the second quarter declined to $7.1 million compared with $9 million in the year-ago period.

One reason for the decline in revenues was the loss of some contracts because of disagreements during negotiations, a spokesman said.

When the firm realized it would incur a $4 million shortfall in revenues, it then concentrated on expediting orders scheduled for shipment in the next quarter. Many of these were not completed in time and did not show on the books as revenues, the spokesman said.

One prospective contract, which the spokesman declined to identify but which is believed to have been with the North Atlantic Treaty Organization, Modcomp had been working toward for over a year when negotiations fell through.

About the beginning of the year, Modcomp changed its policy of accepting orders to reduce acceptance of risky contracts obtained for the sake of revenues. Instead, the firm is selecting orders of a better quality which promise to be more profitable, the spokesman said.

This policy was reflected in part by the lack of revenues in the second quarter, he observed.

Modcomp's acquisition of ECS Information Systems, Inc. is expected to be completed shortly, pending settlement of some legal matters by ECS, a spokesman said.

ECS holders will receive an increased number of Modcomp shares because of the price drop of Modcomp stock. Modcomp was quoted at $11.25 July 28 and as of Aug. 18 was $5.25.

Modcomp is currently negotiating with its banks to remedy certain defaults in its loan agreement caused by the results. The firm has changed from an unsecured to a secured loan.

The banks have indicated a willingness to advance additional funds in the interim.

In the six months, revenues dropped to $16.9 million compared with $17.7 million a year ago.

The firm lost $3.6 million or $1.28 a share compared with earnings of $1.1 million or 42 cents a share in the same period last year.

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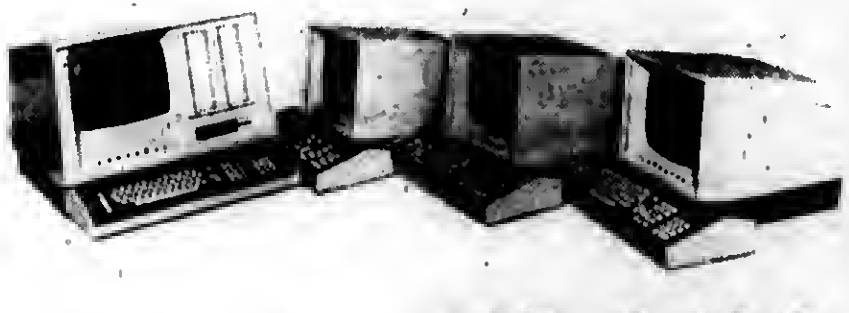

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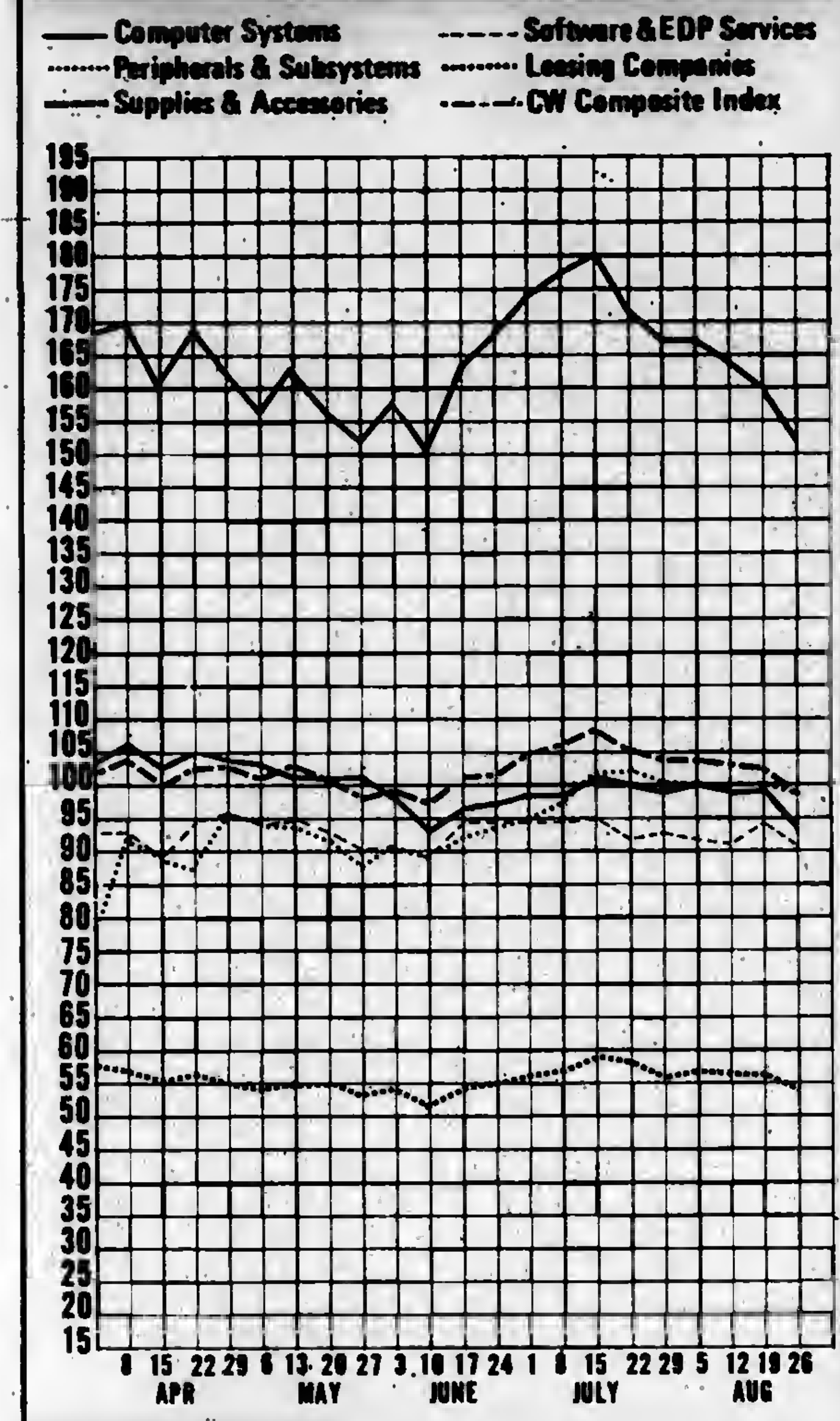

Earnings Reports

MANAGEMENT ASSISTANCE
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.10	$.01
Revenue	28,718,000	21,910,000
Spec Cred	c1,037,000	b(383,000)
Earnings	3,058,000	383,000
6 Mo Shr	.20	.08
Revenue	57,106,000	44,795,000
Spec Cred	c2,563,000	e110,000
Earnings	6,043,000	2,397,000

a-Restated to reflect accounting change for foreign currency translation. b-Includes $592,000 write-off of settlement agreement less tax-loss carryforward credit of $209,000. c-Tax-loss carryforward. e-Includes $702,000 tax-loss carryforward credit and $592,000 write-off of settlement agreement.

PERTEC
Three Months Ended March 26

	1976	1975
Shr Ernd	$.27	$.28
Revenue	11,131,000	12,990,000
Earnings	858,000	859,000
9 Mo Shr	.78	.59
Revenue	36,690,000	34,530,000
Earnings	2,485,000	1,819,000

MEDTRONIC
Year Ended April 30

	1976	a1975
Shr Ernd	$1.77	$1.36
Revenue	129,971,000	99,766,000
Disc Op	(240,000)	44,000
Earnings	13,085,000	9,463,000
3 Mo Shr	.40	.37
Revenue	33,340,000	29,915,000
Disc Op	(48,000)	(36,000)
Earnings	3,006,000	2,710,000

a-Restated.

TELEX
Year Ended March 31

	1976	1975
Shr Ernd	$.62	$.13
Revenue	106,243,000	106,116,000
Spec Cred	a2,967,000	c395,000
Earnings	6,600,000	1,397,000
3 Mo Shr	.18	.06
Revenue	28,580,000	24,777,000
Spec Cred	b792,000	c395,000
Earnings	1,874,000	646,000

a-Consists of $2.6 million tax-loss carryforward and $399,000 gain from early extinguishment of debt. b-Consists of $724,000 tax credit and $68,000 gain from early extinguishment of debt. c-Tax-loss carryforward.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 23, 1978

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTEK SYSTENS

EXCN		PRICE 197A RANGE 111	CLOSE AUG 23 1978	WEEK NET CNNGE	WEEK PCT CHNGE
N	BUKKOUGNS CORP	84-108	91 7/8	+2 3/8	+2.9
O	COMPUTEK AUTOMATION	10- 19	14 7/8	- 3/8	-2.4
N	CONTROL DATA CORP	18- 27	22 1/8	-1 1/8	-4.8
N	OATA GENERAL CORP	40- 60	47 5/8	-2	-4.0
O	OATAPOINT CORP	24- 46	33	-1	-2.9
O	OIGITAL COMP CONTROL	2- 7	3 1/4	- 1/8	-2.3
N	OIGITAL EQUIRNENT	138-181	163 1/4	-10 1/2	-6.0
N	ELECTRONIC ASSOC.	2- 3	2 5/8	- 1/8	-4.3
A	ELECTRONIC ENGINEER.	7- 18	8 1/2	- 7/K	-9.3
N	FORBORO	28- 47	44 1/4	-1 3/8	-3.0
O	GENERAL AUTOMATION	5- 11	8 7/8	- 3/4	-9.8
O	GRI CONPUTEK CORP	1- 1	1/2	0	0.0
N	NEWLETT-PACRARO CO	83-117	87	-13	-14.7
N	NONEYWELL INC	34- 36	44 5/8	-2 3/4	-3.8
N	IBM	227-280	272	-7 1/2	-2.6
O	MANAGEMENT ASSIST	1- 3	1 7/8	0	0.0
O	MEMOREX	18- 33	22 3/4	-3 1/4	-12.3
O	MICROOATA CORP	10- 27	24	-3 1/8	-11.5
O	MODULAR COMPUTER SYS	3- 14	3 1/4	0	0.0
N	NCP	24- 38	33 1/8	-1 7/8	-3.3
O	PRIME COMPUTER INC	4- 14	11 1/2	- 1/2	-4.1
N	PERKIN-ELMER	19- 27	20 1/2	- 1/2	-2.3
N	RAYTHEON CO	43- 66	39 1/4	-4 1/8	-6.3
N	SPERRY RAND	40- 32	44	-2 1/R.	-4.6
O	SYCOP INC	20- 31	21	-2	-8.6
A	SYSTEMS ENG. LABS	8- 10	7 7/8	- 1/4	-3.0
N	VARIAN ASSOCIATES	13- 17	13 3/8	- 1/2	-3.5
A	WANG LABS.	11- 20	13 1/4	- 3/8	-2.3

LEASING COMPANIES

EXCN		PRICE 197A RANGE 111	CLOSE AUG 23 1978	WEEK NET CNNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	- 1/4	-3.2
A	COMMERCE GROUP CORP	2- 3	2 3/4	+ 1/4	+10.0
A	COMPUTER INVSTRS GRP	1- 3	2	- 1/4	-11.1
N	OATRONIC RENTAL	0- 1	1 1/8	0	0.0
A	DCL INC	1- 1	3/8	+	+10.0
N	DPF INC	5- 8	6 1/2	- 3/8	-8.7
A	GREYNOUND CONPUTER	3- 8	7 3/8	0	0.0
N	ITEL	6- 13	12 3/8	- 5/8	-4.8
N	LEASCO CORP	8- 19	15 1/4	-1	-6.1
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NBG INC	0- 1	3/8	0	0.0
A	PIONEER TER CORP	6- 9	7 5/8	+ 1/M	+1.6
N	U.S. LEASING	7- 12	9	- 7/8	-8.8

EXCN: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASN
L=NATIONAL; N=NIDWEST; O=OVER-THE-COUNTER
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SOETWARE & EOR SERVICES

EXCN		PRICE 1976 KANGE 111	CLOSE AUG 23 1976	WEEK NET CNNGE	WEEK RCT CHNGE
O	ADVANCED COMP TECH	1- 3	2	0	0.0
O	ANACOMP INC	8- 11	8 1/8	+ 1/8	+1.5
A	APPLIED DATA RES.	2- 4	3 3/4	- 1/4	-8.2
N	AUTOMATIC DATA PROC	17- 33	30 3/8	-1 3/8	-3.0
O	COLEMAN AMERICAN COS	3- 6	2 1/2	0	0.0
O	COMPUTER DIMENSIONS	3- 7	3 1/4	- 1/8	-2.3
O	COMP ELECTION SYSTMS	5- 9	3 1/4	- 1/2	-8.8
O	COMPUTEK HORIZONS	1- 2	1 3/4	- 1/4	-12.3
O	COMPUTER NETWORK	2- 8	3 3/8	+ 1/4	+7.4
N	COMPUTER SCIENCES	4- 8	6 1/4	- 1/2	-7.4
O	COMPUTER TASK GROUP	1- 1	1 3/8	+ 1/8	+10.0
O	COMPUTER USAGE	3- 8	3	- 1/8	-4.0
O	COMSHARE	2- 9	3	-1	-18.8
O	OATA DIMENSIONS INC	2- 4	2 3/4	- 1/8	-4.3
O	DATATAB	1- 1	1 1/4	0	0.0
N	ELECTRONIC OATA SYS.	12- 18	17	- 1/4	-1.4
O	INEONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORR	1- 3	1 1/2	0	0.0
O	IRS COMPUTER NARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 3/8	- 1/4	-9.3
O	REYDATA CORP	2- 3	1 7/8	+ 1/8	+7.1
O	LOGICON	3- 4	3 3/8	0	0.0
A	NANAGENENT DATA	L- 3	2	0	0.0
A	NATIONAL CSS INC	13- 23	21 3/4	- 3/4	-3.3
A	ON LINE SYSTENS INC	18- 22	19 7/8	-1 1/2	-7.0
N	PLANNING RESEARCH	3- 3	3 1/2	- 1/8	-3.4
O	PROGRANNING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 3	2 1/4	- 1/8	-3.2
O	REYNOLDS & REYNOLDS	13- 21	18	-1 1/4	-7.2
O	SCIENTIEIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	19- 24	23 3/R	-1 3/8	-3.1
A	URS SYSTENS	3- 3	3 3/8	- 3/8	-14.7
N	WYLY CORP	2- 7	1 3/4	- 3/8	-28.3

PERIPHERALS & SUBSYSTEMS

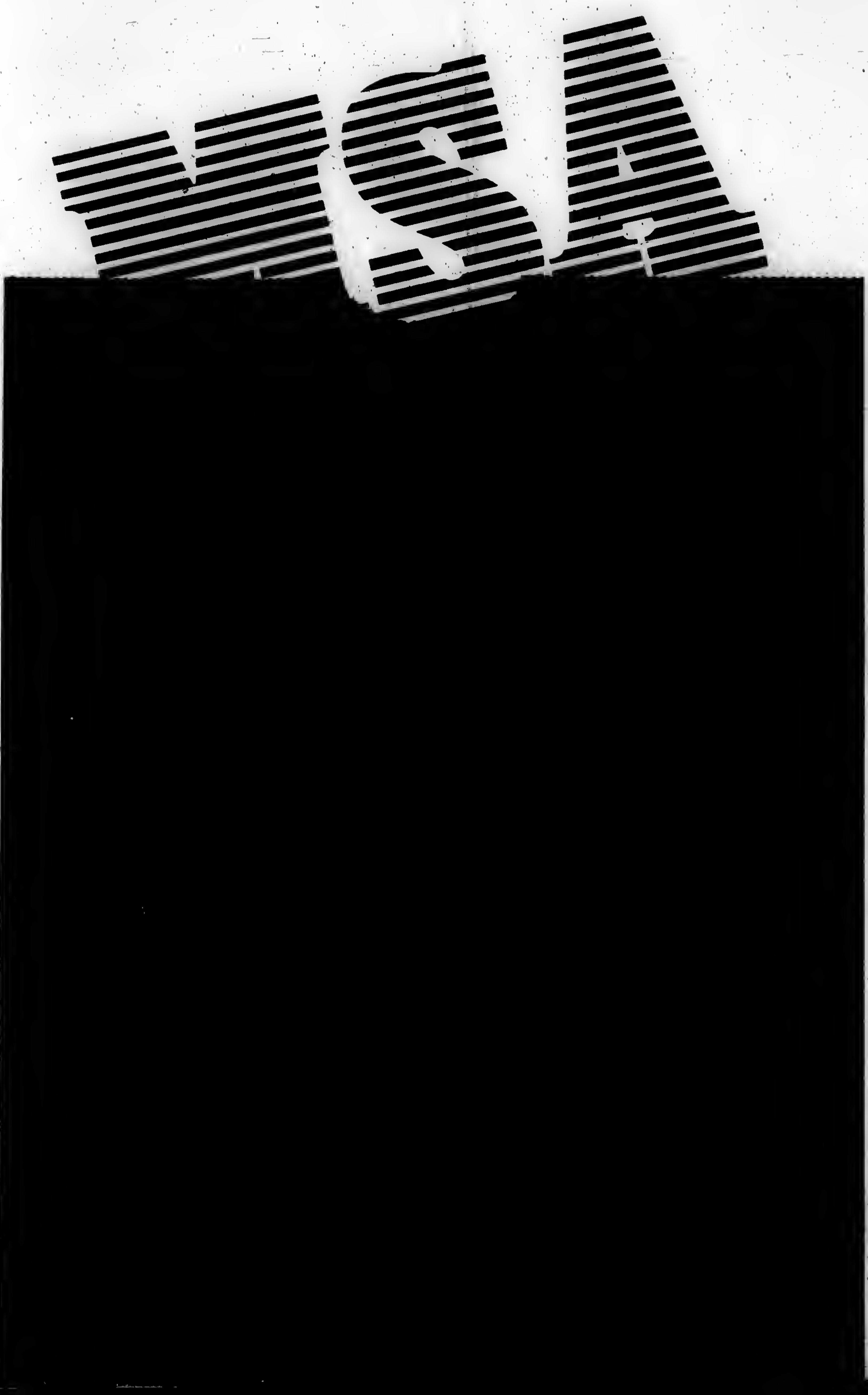
EXCN		PRICE 1976 KANGE 111	CLOSE AUG 23 1976	WEEK NET CNNGE	WEEK RCT CHNGE
N	ADDRESSOGRAPH-MULT	K- 13	9 1/R	- 1/4	-2.6
O	ADVANCED MEMORY SYS	4- 10	6 3/8	- 1/4	-3.7
N	AMPER CORP	5- 10	7 3/8	- 7/K	-10.2
O	ANDERSON JACOBSON	2- 4	2 3/4	0	0.0
O	APPLIED DIG DATA SYS	13- 23	19 1/4	-1	-4.9
O	BEENIVE MEDICAL ELEC	3- 9	7 3/4	- 3/4	-K.8
A	BOLT,BERANEK & NEW	7- 11	8 3/4	- 5/8	-6.6
N	BUNKER-RAMO	3- 10	7 3/4	- 1/2	-8.0
A	CALCOMP	4- 7	5	- 1/4	-4.7
O	CAMBRIDGE MEMORIES	0- 6	5/8	0	0.0
N	CENTRONICS DATA COMP	20- 36	31	-1 5/8	-4.9
O	CODEX CORP	22- 42	34 1/2	- 1/2	-1.4
O	COGNITRONICS	1- 1	7/8	0	0.0
O	CONPUTEK COMMUN.	1- 8	5 1/4	0	0.0
O	COMPUTER CONSOLES	4- 7	3 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	+ 1/8	+8.3
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	CONTEN	4- 9	6 1/2	- 1/4	-3.7
N	CONRAC CORP	20- 25	20 1/4	-1 7/8	-8.4

ERCN		PRICE 1976 RANGE 111	CLOSE AUG 23 1976	WEEK NET CHNGE	WEEK PC7 CHNGE
O	DATA ACCESS SYSTEMS	1- 4	3 1/4	0	0.0
O	DATA 100	7- 13	7 7/R	- 1/4	-3.0
A	DATA PRODUCTS CORP	3- 13	12 1/2	- 3/8	-4.7
O	DATA TECHNOLOGY	1- 2	1 3/8	+ 1/8	+8.3
O	DATUM INC	1- 2	1 1/2	0	0.0
O	DECISION DATA COMPUT	1- 4	1 3/8	- 3/8	-21.4
O	DELTA DATA SYSTEMS	1- 1	1	- 1/R	-11.1
N	ELECTRONIC M & M	1- 4	3 3/8	- 3/8	-10.0
O	FABRI-TEK	1- 1	3/8	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/8	0	0.0
N	HAZELTINE CORP.	4- 12	7 3/4	- 7/8	-10.1
N	HARRIS CORP	34- 33	31	-1 1/4	-2.3
A	INCOTERM CORP	9- 20	8 7/8	- 3/8	-4.0
O	INFOREX INC	3- 7	3 7/K	- 1/9	-3.1
O	INFORMATION INTL INC	10- 18	11 3/8	0	0.0
O	INTEL CORP	39-109	61 1/2	-2	-3.1
A	LUNDY ELECTRONICS	4- 7	3 3/4	0	0.0
O	N3I DATA CORP.	3- 7	8 1/8	- 3/8	-9.2
A	MILGO ELECTRONICS	13- 21	13 7/8	- 3/4	-4.3
N	MOHAWK DATA SCI	3- 10	8 1/8	- 7/8	-9.7
O	PENRIL CORP	1- 3	2 1/4	+ 1/R	+3.R
A	PERTEC CORP	3- 8	6 3/8	+ 1/8	+1.9
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	3- 10	4 1/2	0	0.0
O	QUANTOR CORP	4- 6	4 1/2	- 3/8	-7.6
O	RECOGNITION EQUIP	6- 11	7 3/8	- 3/4	-9.2
N	SANDERS ASSOCIATES	8- 11	8	- 1/4	-3.0
O	SCAN DATA	2- 4	2	- 1/8	-3.8
O	STORAGE TECHNOLOGY	9- 13	11	- 3/4	-6.3
O	T BAR INC	3- 10	3 1/2	- 1/8	-2.2
O	TALLY CORP.	4- 8	4 1/4	- 1/4	-3.3
O	TEC INC	3- 3	3 3/4	0	0.0
N	TEKTRONIX INC	43- 87	A1 1/8	-2 3/8	-4.1
N	TELEX	2- 3	3	- 1/8	-4.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 3/8	- 1/4	-9.3

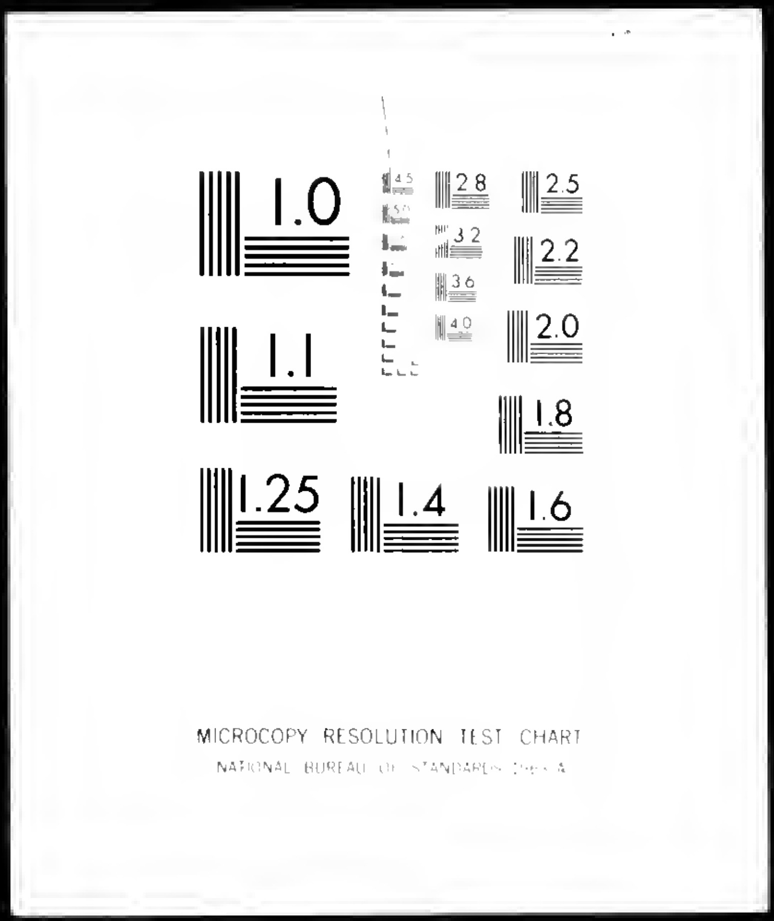
SUPPLIES & ACCESSORIES

ERCN		PRICE 1976 RANGE 111	CLOSE AUG 23 1976	WEEK NET CHNGE	WEEK PC7 CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 3	3	- 1/4	-7.8
A	BARRY WRIGHT	6- 10	7 3/8	0	0.0
O	CYBERNATICS INC	1- 1	1/2	- 1/K	-20.0
A	DATA DOCUMENTS	25- 42	25 3/8	-3 1/8	-10.9
O	DUPLEX PRODUCTS INC	14- 24	13 7/8	- 1/4	-1.7
N	ENNIS BUS. FORMS	8- 8	6 3/8	- 1/4	-3.7
O	GRAHAM MAGNETICS	8- 13	9 1/4	- 1/2	-5.1
O	GRAPHIC CONTROLS	13- 19	14 3/4	-1	-6.3
N	3M COMPANY	33- 65	61 3/8	-2 1/8	-3.3
O	MOORE CORP LTD	38- 31	38 1/2	-2 1/4	-3.3
N	NASHUA CORP	11- 18	18 1/4	- 3/4	-4.4
O	STANDARD REGISTER	15- 19	15 1/4	- 3/4	-4.6
O	TAB PRODUCTS CO	5- 11	9	- 1/4	-2.7
N	UARCO	20- 25	20 1/4	- 3/4	-3.5
A	WABASH MAGNETICS	4- 8	7	- 1/8	-1.7
N	WALLACE BUS FORMS	19- 23	20 3/K	- 3/8	-1.7

SHOPPING FOR FINANCIAL SOFTWARE?
TALK WITH THE INDUSTRY LEADER.



RESOLUTION CHART


1.0
1.1
1.25
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1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and 100/20 = 5.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and 7.9 x 5 = 39.5 lines per millimeter recorded satisfactorily. 10.0 x 5 = 50 lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.